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AIRCRAFT

March, 1910 Edited by ALFRED W. LAWSON 10 Cents a Copy

BALDWIN'S

VULCANIZED PROOF MATERIAL

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BALDWIN'S VULCANIZED PROOF MATERIAL

USED IN THE U. S. GOV. DIRIGIBLE AND SPHERICAL BALLOONS

WILL last from five to six times as long as a varnished balloon. The weight is always the same, as it does not require further treatment. Heat and cold have no effect on it, and ascensions can be made as well at zero weather as in the summer time. The chemical action of oxygen has not the same detrimental effect on it as it has on a varnished material. Silk double-walled VULCANIZED PROOF MATERIAL has ten times the strength of varnished material. A man can take care of his PROOF balloon, as it requires little or no care, and is NOT subject to spontaneous combustion. Breaking strain 100 lbs. per inch width. Very elastic. Any weight, width, or color. Will not crack. Waterproof. No talcum powder. No revarnishing. The coming balloon material, and which, through its superior qualities and being an absolute gas holder, is bound to take the place of varnished material. The man that wants to have the up-to-date balloon must use VULCANIZED PROOF MATERIAL. Specified by the U. S. SIGNAL CORPS.

AEROPLANE MATERIAL A SPECIALTY

Prices and Samples on application

CAPTAIN THOMAS S. BALDWIN, Box 78, Madison Square, NEW YORK

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ALFRED W. LAWSON

Editor of Aircraft

AIRCRAFT

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SUMMARY OF HUMAN FLIGHT

By Mrs. J. Herbert Sinclair

ASIDE from the many myths set forth in almost every country in the world concerning man's aspiration to fly, the Chinese were probably the first to make any substantial headway in the germ of the art.

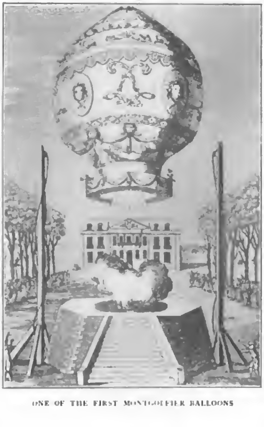
They began by experimenting with the kite, which is nothing more or less than a motorless aeroplane anchored to the ground by a string, more than 300 years before the birth of Christ. It is recorded that about this time a Chinese general, Han Sin, brought his army to the relief of a beleaguered town and by means of kites signaled to the inhabitants indicating the direction of his operations.

It was reported by a French missionary visiting China during the year 1694, that he had seen the records of the Coronation of Emperor Fo-Kien at Pekin in the year 1306, mentioning the fact that a balloon ascension was one of the features of the ceremonies.

Leonardo da Vinci, the celebrated Italian artist, philosopher, and scientist spent much of his time during the fifteenth century in an effort to construct a heavier-than-air machine of the wing-flapping variety, and the technical details of his drawings, which are still in existence, shows that he possessed a remarkable aptitude for working out mechanical problems.

Fauste Veranzio of Venice is credited with being the first human being who has ever dared to risk his life while experimenting with flying apparatus. In 1617 he constructed a crude sort of a parachute consisting of a square frame covered with canvas with which he let himself drop from a high tower.

In 1648, John Wilkins, Bishop of Chester, built a flying machine to be propelled by steam which did not fly, and shortly afterwards Cyrano de Bergerac undertook to float away into space by attaching air-bags to his body and allowing them to heat in the sun. His efforts, too, were unsuccessful.



ONE OF THE FIRST MONTGOLFIER BALLOONS

In 1685 Bartholomaus Laurenzo de Gusmann of Lisbon is said to have covered a wooden basket with paper, and, filling it with hot air, rose from the ground in the presence of the Royal Court at Lisbon. This statement, however, is contradicted by the followers of Montgolfier, who claim that a monk named Bartholomaus Laurenzo made some experiments along this line, and that twenty-five years afterwards another man named de Gusmann proposed to descend from a tower in Lisbon with a flying machine similar in construction, but was prevented in doing so by a howling mob who thought he was a lunatic.

In 1742 the Marquis de Bacqueville, of Paris, built a machine with which he glided from the window of his mansion, crossed the gardens of the Tuileries, and landed in the middle of the Seine.

As far back as even mythology carries us, we find that not only did man dream of flying, but that two distinct methods of procedure were considered as being feasible; namely, the lighter-than-air type, which depend for their support upon the buoyancy of some gas lighter than air which at the present time have taken shape in free balloons and dirigible balloons, and the heavier-than-air type, such as aeroplanes, orthopters, helicopters, etc., which depend for their support upon the dynamic reaction of the air itself.

The general term signifying the former method is scientifically called *aerostatics*, while the latter is known as *aerodynamics*.

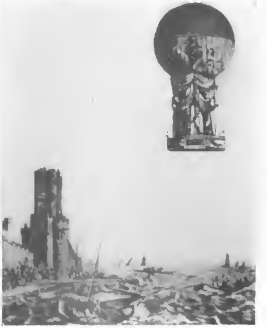
Successful aerostatics preceded successful aerodynamics, and the first really authentic record of man being raised into the air by means of an aerostat was accomplished in Paris on October 15, 1783, when Pilatre de Rozier was lifted 80 feet into the air in a balloon constructed by the Montgolfier brothers. To these two brothers, Stephen and Joseph, therefore, belong the honor of having built the first successful man-carrying, lighter-than-air vehicle.

Joseph Montgolfier was the first to interest himself in the study of aeronautics and as early as 1771 he began to experiment with mechanical devices for the purpose of flying. Hydrogen was discovered by Cavendish in 1776, and the Montgolfier brothers began experimenting by filling paper bags with it which immediately escaped through the pores.

as did also smoke which they had at first experimented with. On June 5, 1783, they constructed a paper balloon 112 feet in circumference and inflated it with hot air by placing a fire beneath it. The balloon arose to a height of nearly a thousand feet, but dropped back to the ground again as soon as the hot air escaped from it. Later they constructed a balloon made of water-proof linen having a capacity of 52,000 cubic feet, which made an eight-minute voyage into the air, carrying as passengers a sheep, a cock, and a duck, and all returning safely to ground.

The first woman to make a balloon ascension was Madame Thible, who went up in the presence of King Gustavus III of Sweden, at Lyons, June 4, 1784. She reached a height of 9,000 feet and returned safely to ground within an hour.

While the linen balloon originally invented and utilized by the Montgolfier brothers could be made to ascend by the use of hot air generated by burning a mixture of straw and wool, still it was found inadequate for the purpose of holding the more elusive hydrogen gas which escaped too quickly through its pores.



THE ROZIERE
BUILT BY PILATRE DE ROZIER

The success of the Montgolfiers, however, had the tendency of creating enthusiasm for ballooning and bringing into the field inventive genius, and a little later on Professor Charles constructed a spherical balloon, which in many respects is similar to those built at the present time.

The covering of the Charles balloon was made of silk and coated with a rubber solution. An outer net was extended over the upper half of the aerostat for the purpose of supporting the silk covering and distributing the pressure more uniformly over the entire surface, and ending in a wooden ring which was made fast to the car by ropes. He placed a valve at the top of his balloon to allow the gas to escape at his will for the purpose of making a descent. The valve was operated from the car by ropes. At the bottom of his balloon was a tube about eight inches in diameter through which the gases were passed into the balloon, and through which the gas could escape in case of expansion. The gas was formed by the reaction of sulphuric acid on iron trimmings and passed through water in barrels.

BLANCHARD AND JEFFRIES DEPARTING FROM DOVER, ENGLAND, FOR THE CONTINENT IN A BALLOON, JANUARY 7, 1785.

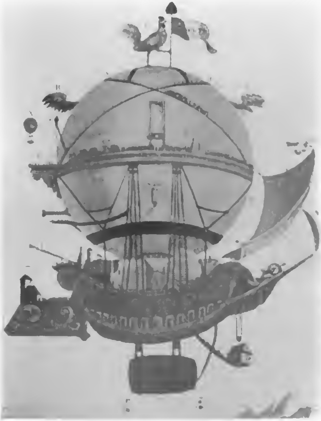
With this balloon Charles made his first ascent on December 1, 1783, and after being in the air over four hours landed about 45 miles from the starting-point.

A professional balloonist named Blanchard, and a scientist named Jeffries, were successful in crossing the English Channel in a balloon, from Dover, England, to Calais, France, on January 7, 1785, after a most dangerous trip in which they only succeeded from being dumped into the water several times by throwing away their provisions, scientific instruments and clothing, as a means to lighten their vehicle.

Pilatre de Rozier undertook to repeat the performance of Blanchard and Jeffries on June 16, 1785, by going in the opposite direction with the French shore as a starting point. His balloon was called "aero-Montgolfier," and was a combination of the Montgolfier and Charles ideas. The balloon rose rapidly for several feet, when in some way the hydrogen took fire and exploded, causing Rozier and his assistant to fall to the ground, and killing both of them.

This accident had the effect of allaying the enthusiasm of the followers of ballooning to a considerable extent, and for some time afterward there were few men who could be found willing to go up into the air under any consideration.

(To be Continued in Aircraft for April.)



FANTASTIC PLAN PRESENTED BY CITIZEN MONGE, OF ENGLAND, IN 1798, FOR THE PURPOSE OF CONVEYING THE ARMY OF ENGLAND FROM THE GALLIC SHORE AND EXCHANGING FRENCH LIBERTY FOR ENGLISH HAPPINESS

THE PROGRESS OF BALLOONS

From the New York Gazetteer, Tuesday, December 28, 1784

By Courtesy of Miss Marie Wait

Verdonita tellus, tumida cesserunt freta,
Inferna nostros regua scusere impetus
Immune coelum est, dignus Alcidae labor,
In alta mundi spatia sublimes feremur.

Assist me, ye Muses (whose harps are in tune),
To tell of the flight of the gallant balloon:
As high as my subject permit me to soar
To heights unattempted, unthought of before.

Ye grave, learned doctors, whose trade is to sigh,
Who labor to chalk out a road to the sky,
Improve on your plans—or I'll venture to say
A chymist, of Paris, will show us the way.

The earth, on its surface, has all been survey'd,
The sea has been travell'd—and deep in the shade
The Kingdom of Pluto has heard us at work,
When we dig for his metals, wherever they lurk.

But who would have thought that invention could rise
To find out a method to soar to the skies,
And pierce the bright regions, which ages assign'd
To spirits unbodied and flights of the mind.

Let the Gods of Olympus their revels prepare—
By the aid of some pounds of inflammable air
We'll visit them soon—and forsake this dull ball,
With coat, shoes and stockings, fat carcase and all.

How France is distinguish'd in Louis's reign!
What cannot her genius and courage attain?
Throughout the wide world have her arms found the way
And *Art* to the stars is extending her sway.

At sea let the British their neighbors defy—
The French shall have frigates to traverse the sky—
In this navigation more fortunate prove,
And cruise at their ease in the climates above.

If the English should venture to sea with their fleet,
A host of balloons in a trice they shall meet,
The French from the zenith their wings shall display
And souse on these sea dogs and bear them away.

Ye sages who travel on mighty designs,
To measure meridians and parallel lines—
The talk being tedious—take heed if you please—
Construct a balloon—and you will do it with ease.

And ye who the heaven's broad concave survey,
And, aided by glasses, its secrets betray,
Who gaze, the night through, at the wonderful scene,
Yet still are complaining of vapors between.

Ah, seize the conveyance, and fearlessly rise
To peep at the *lauthorns* that light up the skies,
And floating above, on our ocean of air,
Inform us, by letter, what people are there.

In Saturn advise us if snow ever melts,
And what are the uses of Jupiter's belts;
And (Mars being willing) pray send us word greeting
If his people are fonder of fighting than eating.

That Venus has horns we've no reason to doubt
(I forget what they call him who first found it out),
And you'll find, I'm afraid, if you venture too near
That the spirits of cuckolds inhabit her sphere.

Our folks of good morals it woefully grieves
That Mercury's people are villains and thieves,
You'll see how it is—but I venture to show,
For a dozen among them, twelve dozen below.

From long observation one proof may be had
That the men in the moon are incurably mad,
However, compare us, and if they exceed,
They must be surprisingly crazy indeed.

But now to have done with our planets and moons,
Come, grant me a pattern for making balloons,
For I find that the time is approaching—the day—
When horses shall fail and the horsemen decay.

Post riders at present (call'd centaurs of old)
Who brave all the seasons, hot weather and cold,
In future shall leave their dull ponies behind
And travel, like ghosts, on the wings of the wind.

The stageman, whose gallopers scarce have the power
Through the dirt to convey you ten miles in an hour,
When advanc'd to balloons shall so furiously drive,
You'll hardly know whether you are dead or alive.

The man who at Boston sets out with the sun,
If the wind should be fair may be with us at one,
At Gunpowder Ferry drink whisky at three,
And at six be at Edenton ready for tea.

(The machine shall be order'd, we hardly need say,
To travel in darkness as well as by day.)
At Charleston by ten he for sleep shall prepare,
And by twelve the next day be the Devil knows where.

When the ladies grow sick of the city in June,
What a jaunt they shall have in the flying balloon!
Whole mornings shall see them at toilets preparing,
And forty miles high be their afternoon's airing.

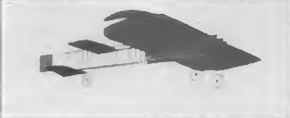
Yet more with its fitness for commerce I'm stuck,
What broad loads of tobacco shall fly from Kentuck'!
What packs of best beaver, bar iron and pig!
What budgets of leather from Conoccocheague!

If Britain should ever disturb us again
(As they threaten to do in the next George's reign),
No doubt they will play us a set of new tunes,
And pepper us well from their fighting balloons.

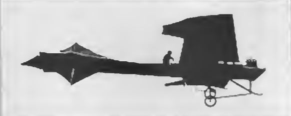
To market the farmers shall shortly repair
With their hogs and potatoes, wholesale thro' the air,
Skim over the water as light as a feather,
Themselves and their turkeys conversing together.

Such wonders as these from balloons shall arise—
And the giants of old that assaulted the skies,
With their Ossa on Pelion, shall freely confess
That all they attempted was nothing to this.

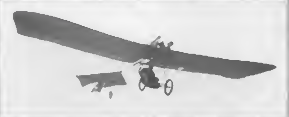
TYPES OF SUCCESSFUL AEROPLANES



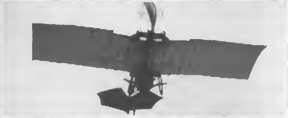
BLEROIT MONOPLANE



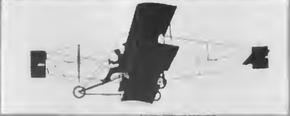
ANTOINETTE MONOPLANE



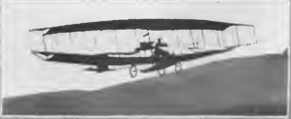
GRADE MONOPLANE



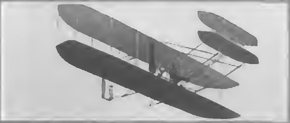
SANTOS DUMONT MONOPLANE



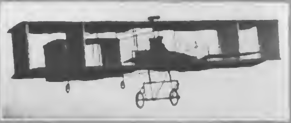
CURTIS BIPLANE



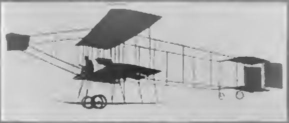
AERIAL EXPERIMENT ASS'N. BIPLANE



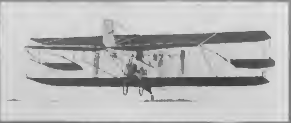
WRIGHT BIPLANE



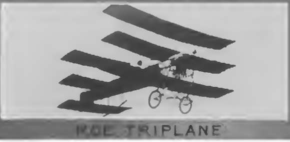
VOISIN BIPLANE



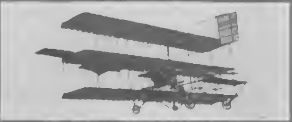
HENRY FARMAN BIPLANE



CODY BIPLANE

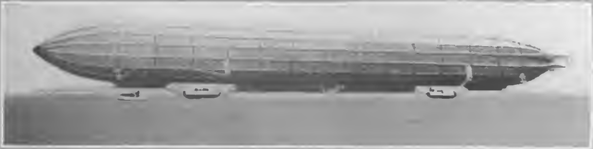


ROE TRIPLANE

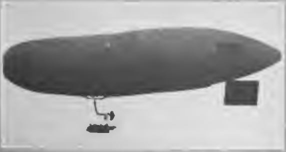


VANNIMAN TRIPLANE

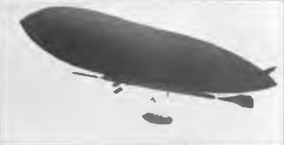
TYPES OF SUCCESSFUL DIRIGIBLES



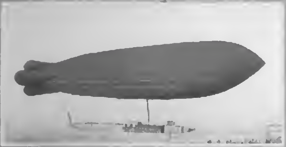
ZEPPELIN, GERMANY



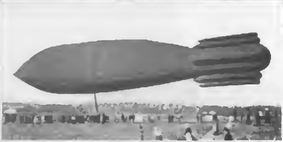
PARSEVAL, GERMANY



GROSS, GERMANY

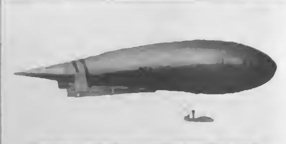


BAYARD-CLEMENT, FRANCE

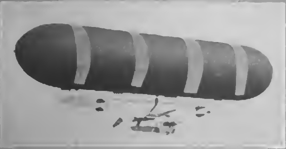


LA VILLE DE PARIS, FRANCE

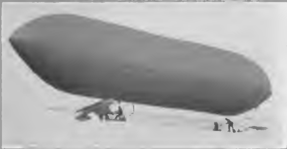
REPUBLIQUE, FRANCE



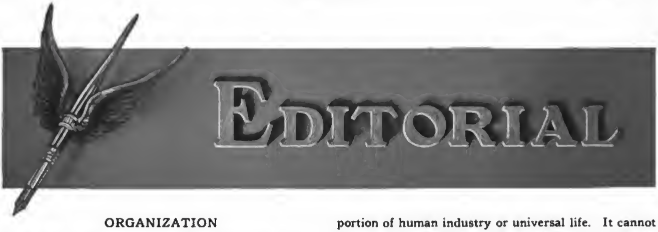
ITALIAN MILITARY DIRIGIBLE



BRITISH MILITARY DIRIGIBLE



BALDWIN, AMERICA



EDITORIAL

ORGANIZATION

LIFE IS A COMPLETE SYSTEM of organization. Study the entire universal scheme as far as the infinitesimal intelligence of man is capable of doing, and it will be found that all things are tending toward a complete state of organization.

The microbes in the blood of man organize—man himself is a system of organized parts—men organize themselves into communities, States, nations. Eventually they will organize themselves into one complete body in which all of the various units will enjoy equal opportunities to aid in the production, distribution and consumption of the earth's bountiful supply of good things.

In his upward progressive march man has just arrived at the threshold of mechanical flight. He has built a few crude toy machines with which he has proven that it is possible to fly. He will now go ahead to perfect these machines and bring them into commercial use for the purpose of transporting himself and baggage from place to place in the least possible time and with the least possible expenditure of energy. He will spend a great many years in the study of and adaptation to aerial navigation, just as he has spent a great many years in the study of and adaptation to other new conditions which were formerly new and incomprehensible to him.

With the development of aircraft, organization in the movement will gradually take place, until the time finally arrives when one human brain will direct the whole aeronautical machinery in all parts of the world. And this human brain will merely be a lieutenant working in conjunction with other lieutenants acting as directors of various other branches of human industry, and all directed by one supreme mind at the head of the whole human race.

At the present time aeronautical organization has just begun to take shape. Aero clubs are being formed in different cities in this country and abroad. These clubs in turn are forming into State organizations, State organizations into national associations, and national associations into an international federation.

This great organization movement is just as natural and necessary in aeronautics as it is in any other portion of human industry or universal life. It cannot be stopped or checked in its advancement. It must go on. There may be here or there an individual who stands aloof with the claim that he is independent and can get along without joining an organization. He can, in just about the same manner that he could get along without the collaboration of every other human being on earth whose combined efforts go to make our modern living possible.

We therefore advise our readers to join aero clubs, and those who live in cities where there are no aero clubs, to organize them; and we advise the different clubs to join the State organizations, and we advise the various State organizations to join the national association, and the national association, which is at present the Aero Club of America, to remain a member of the International Federation Aeronautique, and all pull together to make one grand successful step forward in the aeronautical movement.

HIGH FLYING

WHEN AEROPLANE FLIGHT first began to attract the attention of the public, and both big and little scientists in all parts of the world stopped trying to prove by their figures that such a thing was impossible, the general opinion expressed by the leading men of the aerial movement, and even by the builders of flying machines themselves, was that the aeroplane was destined to be a machine to just skim along the ground, and that it could never be expected to make any high flights. In fact it was all figured out that high flying was to be left entirely to the lighter-than-air craft.

Nearly two years ago the Editor of this magazine began to write upon this subject, and often pointed out the fact that it would be the heavier-than-air type that would eventually do the highest flying. His foresight upon this as well as other things was usually considered visionary by men who can always see an object with powerful glasses or prove an event after it has happened.

The recent flight of Paulhan at Los Angeles, in which that intrepid aviator reached an altitude of nearly a mile, substantiates to a certain degree some of the predictions made by the Editor. But we do not intend to rest upon these laurels, and AIRCRAFT sets itself upon record with a prediction that within ten years heavier-than-air machines will be able to attain a height of over ten miles.

The Editor of AIRCRAFT has some other ideas of what the future will produce in the shape of human flight, which will be recorded from time to time for either the digestion or indigestion of its readers.

o o o

DON'T WHINE

SOME MEN BECOME DISCOURAGED very easily. If every little thing does not go exactly as they would like to have it, they fuss and fume and snort and snivel and wish they were dead; and the ones that usually do the most fussing and sniveling are those who have never had any hard knocks in the earlier stages of their lives. They have not been trained to overcome obstacles, and therefore lose heart when meeting with their first reverses. They do not understand that our present civilization has been built on failures, and that for every success there are hundreds of failures.

It is the overcoming of obstacles in life which makes man strong, and the more of these he has to encounter the stronger he will become.

Life is merely a series of trials which the human being is put through, and his ultimate strength depends upon how many and how difficult are the tasks he undertakes.

If he tries and fails and then quits he is a pretty weak creature. But if he tries and fails and then tries again, he gains strength, and the more trials and failures and trials again the greater becomes his strength—that is, if he does not waste part of it in whining.

At the present time we find ourselves scattered about a globular mass flying through space. Where we are going we do not know, and why we are here we haven't the slightest idea. But we do know that we *are* here, and that we are going somewhere, and while our little brains are too immature to comprehend the full situation, still the very least we can do is to make the most of our opportunities; to do our best at all times; to struggle along and create. He who would create anything of worth must expect to have failures, and the greater the task he sets out to accomplish the more failures he will have to put up with. The easier the task the easier it is to succeed.

Study the lives of the greatest men and you will find records of continual failures. We owe our success to those who have failed before us, and those who follow us will owe their success to our failures.

In flying machines the Wright Brothers owe their success to the thousands who tried and failed before them, and the success of others after them will be built upon their failures.

There have probably been more failures in the construction of flying machines than in any other task man has ever set out to accomplish; but then flying is the greatest task he has ever undertaken, and, consequently, the greatest men the world has ever known are those who have devoted their energies to solving the flying problem. They will eventually be placed in the front ranks of history.

It is, perhaps, needless to tell the tens of thousands of flying machine inventors in all parts of the world not to get discouraged. Most of them have met with so many failures that they have become accustomed to them.

Our advice, however, to those who may be inclined at times to become discouraged, is to FIGHT IT OUT. DON'T QUIT and, above all, DON'T WHINE under any circumstances.

o o o

A big blustering fellow stood on the back end of a street car recently and spent a quarter of an hour explaining to a party of his friends the difference between an aeroplane and a monoplane, and when he had finished his friends agreed that he knew all about airships.

His aeronautical learning was no doubt secured from some newspaper.

o o o

When the complete history of aviation is written, the names of C. M. Manley and R. L. Reed must forever be associated with that of the immortal Langley. Manley acted as chief engineer, while Reed was foreman of aerodromics, and made all the drawings for the Langley models and machine. Reed was closely associated with the great scientist from the year 1892 until the day of his (Mr. Langley's) death.

o o o

It is a dull mind that cannot be amused by the antics of its contemporaries, and it is a duller one still that is not forced to grin when looking at its own reflection in a mirror.

o o o

Did you ever notice a great big mastiff trotting along about his own business, while snarling at his heels was a dyspeptic little lapdog? The mastiff, so occupied with his own thoughts, not even noticing the poodle until, unfortunately, one of his hind paws accidentally comes into contact with the puny whelp's nose, causing it to whine with pain. Quite laughable sometimes, but we invariably sympathize with the poodle.

AIRCRAFT is the great big watchdog of the aeronautical movement just now, and we assure the Society for the Prevention of Cruelty to Animals that if his left hind foot should in any way come into contact with the snapping snout of any yelping canine, it will be purely accidental, and our heartfelt sympathy will be extended to the whimpering whelp.

LILIENTHAL

By Charles Heitman

OTTO LILIENTHAL

OTTO LILIENTHAL, inventor, constructor and first pilot to successfully and scientifically glide a heavier-than-air apparatus through space, was born May 24, 1848, at Anklam, in the province of Pomerania, Germany. While still a mere lad he began to study the problem of flight, and at the early age of thirteen years, he constructed, with the help of his brother Gustave, his first gliding machine. He began experimenting at night in the moonlight by launching his machine from the top of a hill and running downwards. At the age of twenty he constructed a machine with movable wings, which was capable of carrying a weight of forty kilograms. His observations in connection with these experiments led him to publish his book, "The Flight of Birds Considered as the Basis of Aviation," which was a remarkable work for that period, and which is of value even now.

THE HILL FROM WHICH LILIENTHAL GLIDED

In 1891 he constructed another machine, consisting of huge wings nearly 23 feet long, curved parabolically. The mountings were of bamboo covered with calico soaked with wax; this machine weighed altogether 18 kilograms. Launching himself from a height of 19 feet, he was able to fly at first for a distance of 16 feet in a strong wind, increasing this distance later to 114 feet, and he could also fly against the wind.

He then built a second, larger glider, on the model of the first, but with dimensions of 16 square meters and a weight of 24 kilograms. With this he was able to cover a distance of 262 feet, at a speed of nearly 23 feet per second.

He removed his machine to Rathenow in 1893, after modifying the wings so as to be able to fold them for transportation. His new proving ground was in the middle of a large field covered by turf and surrounded by regular, conical hills rising in a gentle slope to a height of from 200 to 260 feet. His new machine was composed of large curved surfaces in the form of an open fan. Lilienthal had arranged a place for himself on the left side, and by means of two wooden levers he could augment or diminish at will the form and dimensions of the soaring planes during flight. At the back of his machine he placed a vertical steering gear, which he operated by means of two cables. The weights, of 20 and 100 kilograms respectively when mounted, were well distributed.

With this machine Lilienthal launched himself from a height of 98 feet, and, carried by an ascending wind, he glided upward to a height of from 650 to 980 feet, and was perfectly successful in turning to the right or left by means of light displacements of the center of gravity and of the steering gear. Having thus demonstrated the feasibility of his machine, he undertook to manufacture it and sell it to aeronauts in Germany and elsewhere.

In 1894 he built at Lichterfelde a conical mound 49 feet high and 227 feet in diameter at the base. From this elevation he tried out his new gliding machine, which was composed of two planes placed one over the other, with which he made very successful flights.

Later on he constructed a machine, with beating wings, worked by means of two motors run by carbonic acid; but this apparatus proved worthless.

Lilienthal died a martyr to his inventor's enthusiasm. One day during a successful flight the machine suddenly rose to a height of 33 feet and then fell straight down to the ground and was shattered into fragments. Lilienthal's spine was broken, and he died twenty-four hours later, on August 10, 1896.

Some defect in the machine probably caused the disaster. Lilienthal's apparatus had no longitudinal stability because it consisted of but one carrying surface; the horizontal governing apparatus, moreover, was much too small and set too close to the surface of the bow to be really efficient. The aviator was obliged to use his body as a means to establish the equilibrium, by moving back and forth, just as an acrobat keeps his equilibrium. But he could not remain stationary in the air; his apparatus was liable to rear instead of gliding, because of retrograde movement; and again, it was liable to descend straight down, striking the ground violently with its prow before the aviator had time to make it regain its normal position. As he plunged down in full flight, the machine was shattered and he was killed.

His death was felt as a loss to aviation. "He was," says Wilhelm Kress, "a modest and amiable man. His glides, or flights, were extraordinarily able and were executed with a very unstable apparatus; they not only created a sensation and excited a lively interest, but also gave a new impulse and stimulus to the efforts of other aviators.

The experiments of the unfortunate German inventor were of incontestable value in demonstrating the efficiency of supporting surfaces and the possibility of realizing under the best conditions equilibrium during flight. Lilienthal had no imitators in Germany, but in 1896 Octave Chanute, a Frenchman living in America, began to experiment with man-carrying gliding-machines in which he reversed the method of Lilienthal to restore balance and caused the surfaces themselves to alter their position, so as to bring the center of pressure back vertically over the center of gravity.

Pilcher, an English engineer, who shared the fate of Lilienthal three years later, the late Captain Ferber and Voisin, both Frenchmen, who subsequently distinguished themselves with successful motor aeroplanes in France, also followed his methods, as well as other celebrated pioneers in the science of aviation.

Lilienthal's greatest title to glory is the fact that he was an initiator, and the forerunner of the Wright brothers, who adapted his ideas to their aeroplanes of 1902 and 1903, and to the construction of the mechanical aeroplane. However much his pupils may have gone ahead of their master now, the successful flights of the German engineer in his attempts to overcome the resistance of the air on curved surfaces put him in the foremost ranks of the world's greatest aviators and his name will live for many centuries.

LILIENTHAL IN FLIGHT

BANKING

By Edward H. Young

WHEN a bicyclist turns a corner, he has to lean towards the side on which he is turning, in order to keep from falling, and to keep his proper balance or equilibrium. Similarly a bicyclist or motor cyclist who is racing around a race-track; only in this case the track is sloped or banked at the turns to keep him from sliding or falling off to one side. Now imagine the air as a bank of earth which is sloped the same way where a heavier-than-air flying machine takes a turn; for this is in fact just what takes place.

There is, however, a different principle involved in aeroplane "banking," as it is called, from the principle illustrated by the cyclist leaning to one side at a turn; though both are alike in that the movement serves to the same end. A cyclist is like an inverted pendulum, he being the knob or weight which is fastened at the top of a pendulum rod, and not at the bottom, as in most cases. His bicycle is the pendulum rod which is pivoted to a solid foundation, the ground In making a turn, centrifugal action tends to throw him outward from the turn, and he leans to the turning point to bring the action of gravity into play as a counterbalance to the action of the centrifugal force, this keeping his equilibrium. On the other hand, an aeroplane is like a carpet sweeper, which has a tendency to move straight ahead rather than to make a turn as desired; and which would go straight ahead unless the floor were banked to assist in making the turn. The aeroplane proper corresponds to the sweeper box, and is pushed along by the propellers, which correspond to the handle of the carpet sweeper.

There is, however, another principle which applies to an aeroplane, but which does not apply to the bicyclist. This is the opposition of the aeroplanic principles of "center of pressure" and "center of gravity." The pressure is the upward tendency of the air against the lifting surface of the aeroplane, and tends to support the heavier-than-air flying machine in the air; gravity is the pull of the earth against the machine, and tends to bring it down to the ground. The center of each is the spot where, counting from some point (as the spokes of a wheel) the pressure is evenly directed to all parts of the flying machine. The tendency of each being in opposition, one being upward and the other downward, these two centers must of necessity coincide in the vertical plane.

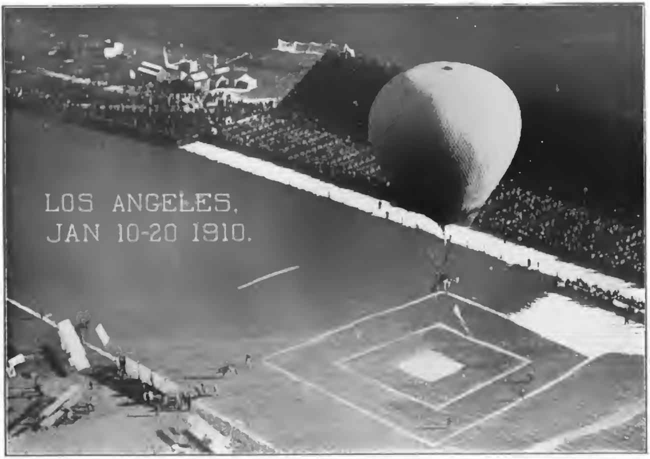
Centrifugal action plays an important part in a heavier-than-air flying machine in making a turn. It has a tendency to throw everything about the machine having weight out towards the rim or periphery of the turn. As centrifugal action only affects parts having weight, and as the pull of gravity also only affects parts having weight, centrifugal action therefore disturbs the center of gravity, tending to throw it to the outside edge of the machine in making a turn. Throwing the center of gravity towards the outside edge causes the center of pressure to move towards the inner edge of the machine (that is, the side of the machine nearest the corner of the turn), causing the coincidence of these two centres to be destroyed. This causes the outside edge of the flying machine to lower and fall towards the ground. This action is disregarded by a great many young experimenters in the art; they build their machines without reference to it and then find out too late that they are wrong in principle.

To overcome this centrifugal action, it is necessary to raise the outside edge of the machine above the horizontal; in other words, to bank it. This causes the pull (or center) of gravity to move towards the inside edge of the machine and meet, and keep in coincidence with, the center of pressure. This action counterbalances the outward force of centrifugal action and keeps the machine in balance or equilibrium.

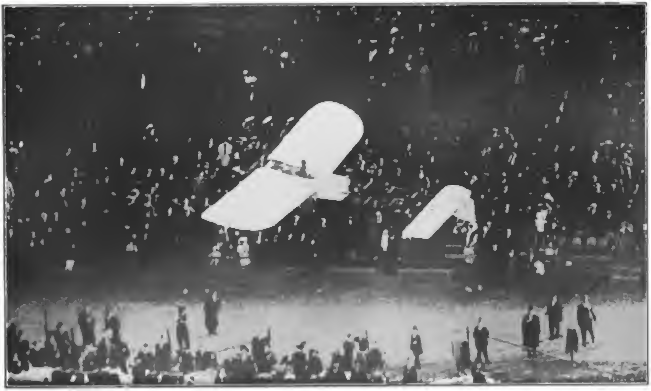
To achieve this result, several different devices are in use. One is the plane-warping principle of the Wright brothers, whereby they raise the rear edge of their surfaces at one end of the machine and lower it below the horizontal at the other. This action causes the side of the aeroplane, whose surfaces are lowered, to shoot up into the air to a higher level and thus bank the machine in making a turn. Another device is the use of wing tips or rudders, whose action is the same as the plane-warping device, though a little slower in its movement. Because of this shortcoming, it is doubtful if it will be found as efficient in high winds as is the other device, for in high winds the action is very rapid and instantaneous correction must be made, delay being dangerous to equilibrium.

It was the lack of the knowledge of how to properly keep an aeroplane in equilibrium in making a turn, that delayed the practical application of the art to commercial uses. As before stated, the old idea was that the machine would naturally raise itself in making a turn, the same as a bird in soaring flight appears to do; but as shown above, this was a mistaken idea.

The outer wing of a soaring bird does not naturally raise itself in making a turn, but the bird raises it to a higher level by almost imperceptibly throwing the wing slightly forward and changing his other wing slightly to the rear. This action, it is true, pertains to a principle different from that heretofore described. The wing that is thrown forward receives the upward pressure of the air first, and also gets the upward pressure of the air in front of the point of fore and aft balance of its body, thus tending to turn it upward and get to a higher level.



A VIEW OF THE STARTING-POINT—PAULHAN'S BIPLANE IS SEEN RISING FROM THE GROUND TO THE LEFT OF THE BALLOON "DISCOVERY."



A BLERIOT MONOPLANE PASSING OVER THE GRAND STANDS

THE LOS ANGELES AERONAUTICAL TOURNAMENT

LOUIS PAULHAN AND WIFE

THE first great aeronautical tournament, in which flying machines as well as airships and sphericals were entered into contests, ever held in the United States took place at Los Angeles, California, from the 10th to the 20th days of January, 1910, and was a most decided success from every conceivable standpoint.

The contests were held on the Dominguez Ranch, a historic old battlefield which originally consisted of about 50,000 acres of mostly level surface.

The grand stand was 750 feet long and 40 feet high, with a seating capacity of about 25,000 including one hundred private boxes. It was built upon the highest stretch of land and overlooked the surrounding plains for miles.

The attendance ran from 20,000 to 50,000 daily, and prominent men and women from all parts of the world were enthusiastic spectators.

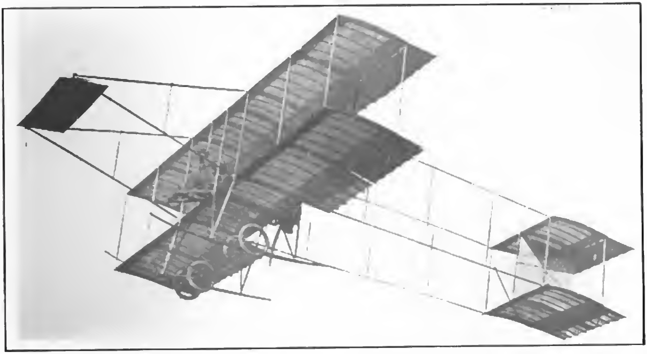
$80,000 was the aggregate amount offered in prizes, of which $10,000 was won by Louis Paulhan and $5,000 by Glenn H. Curtiss, both of whom took part in the International Aviation Meet at Rheims, France, last summer. Paulhan established a new world's record for height by going 4,165 feet up into the air and winning the first prize for the feat. He also won first money for the Endurance and Time and Passenger-carrying contests, while Curtiss took the first prizes for the Speed and Quick Starting contests.

Both Charles K. Hamilton and Charles F. Willard distinguished themselves as great aviators, the former winning first prize for making the Slowest Lap and the latter taking first money for Starting and Landing in a square.

Roy Knabenshue and Lincoln Beachy gave some very pretty exhibitions with their Dirigibles, and Clifford B. Harmon, Dick Ferris, George B. Harrison, J. C. Mars and other celebrated balloonists made some very clever ascensions.

On January 18th Paulhan made one of the most remarkable cross-country flights in history. On the wings of a wind that other aviators hesitated to face, the Frenchman soared from Aviation Field to "Lucky" Baldwin's ranch, twenty-three miles away, circled the old Santa Anita race-track and bucked his way back to his tent.

In all he covered an estimated distance of 47½ miles in 1 hour



THE HENRY FARMAN BIPLANE WITH WHICH LOUIS PAULHAN MADE THE WORLD'S HEIGHT RECORD AT LOS ANGELES

2 minutes 42 4/5 seconds. He flew to Baldwin's with the wind in thirty minutes and came back against it in approximately thirty-three minutes. When he finished he said that the motor was as cool as when he started, and that he could repeat the trip at once.

GLENN CURTISS THE SPEED CHAMPION READY TO FLY

Paulhan attained an altitude of from 1,000 to 2,000 feet on his way over the valley. His highest point was 2,130 feet, as indicated by the instrument in the flyer.

Under him, speeding over country roads, were automobiles, horsemen and motorcycles, trying to be near the machine should Paulhan fall, or have to descend. Mrs. Paulhan was in one of the pursuing automobiles, praying and crying.

When Paulhan reached the grand stand on his return he was mobbed. The crowd broke through the barriers. The aviator was borne over the field. His countrymen kissed him and wept in joy.

CHARLES WILLARD IN ACTION

Among the many ladies who took trips skyward in the balloons and aeroplanes were Mrs. Ada M. Gregory of Chicago, Miss Bertha Freund of Cincinnati, Miss Mae Meyers of San Bernardino, Mrs. Dick Ferris of Los Angeles, and Mme. Paulhan of Paris.

From start to finish there was a dash and spirit to the great show that made it one continuous round of excitement. Los Angeles never saw such crowds before, and the whole population became wildly enthusiastic over the wonderful events.

The aviators were lionized at every turn, and fabulous amounts offered them by promoters to give exhibitions in other cities.

THE MARQUISE DE ROBERT KERSANSON DE PENNENDRIFF TAKING LUNCHEON WITH PAULHAN AND HIS WIFE

The prizes won during the aviation meet follow:

Height.—First, $3,000, Mons. Louis Paulhan, 4,165 feet; second, $2,000, Mr. Charles K. Hamilton, 530.5 feet; third, $500, Mr. Glenn H. Curtiss, no official height taken.

Endurance and Time.—First, $3,000, Mons. Paulhan, 75.77 miles, 1h. 58m. 32s.; second, $2,000, Mr. Charles K. Hamilton, 19.44 miles, 39m. 2/5s.; third, $500, Mr. Glenn H. Curtiss, 16.11 miles, 24m. 54 2/5s.

Speed, Ten Laps.—First, $3,000, Mr. Curtiss, 16.11 miles, 23m. 43 3/5s.; second, $2,000, Mons. Paulhan, 16.11 miles, 24m. 59 2/5s.; third, $500, Mr. Hamilton, 16.11 miles, 30m. 34 3/5s.

Three Laps with Passenger.—First, $1,000, Mons. Paulhan, 4.83 miles, 8m. 16 1/5s. No others contested.

Slowest Lap.—First, $500, Mr. Charles K. Hamilton, 1.61 miles, 3m. 36 2/5s.

Quickest Start.—First, $250, Mr. Curtiss, 98 feet.

THE HARMON BALLOON SHOWING RIP AND THE EXAMINER BALLOON IN TROUBLE

Starting and Landing in a Square.—$250, Mr. Charles F. Willard; score perfect.

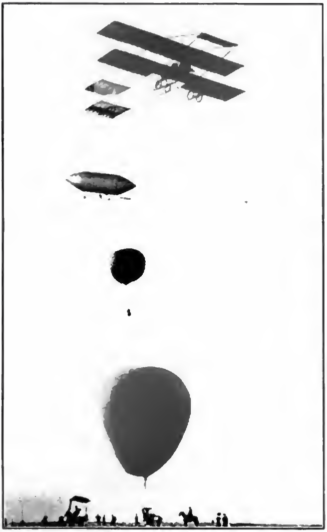
Cross Country.—$10,000, Mons. Paulhan

The following are records for the course also made:

Speed, one lap, 2m. 12s.; Mr. Curtiss.

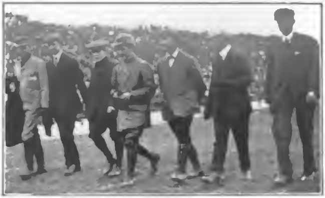
Shortest Time in Rising, 6 2/5s.; Mr. Curtiss.

Dirigibles, one lap, 4m. 57 4/5s.; Mr. Lincoln Beachy.



PAULHAN IN HIS AEROPLANE, BEACHY IN HIS DIRIGIBLE AND FERRIS IN HIS SPHERICAL

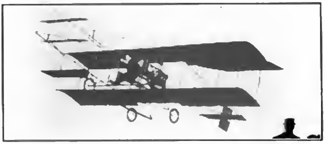
CHARLES HAMILTON IN A CURTISS MACHINE TRYING FOR AN ALTITUDE RECORD



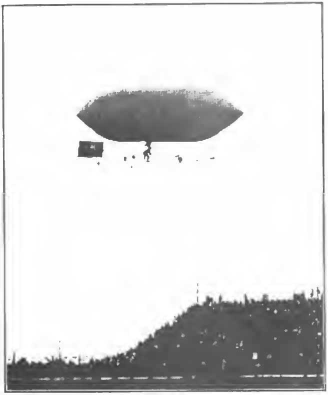
AVIATORS SMITH, CURTISS, MASSON, PAULHAN, MISCAROL WILLARD AND BEACHY ON THE GROUND

DICK FERRIS TAKING HIS FIRST AEROPLANE RIDE WITH PAULHAN

A BUNCH OF AMERICAN BEAUTIES WATCHING THE AVIATORS IN THE RAIN

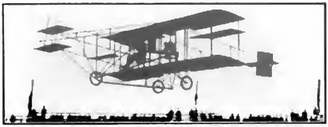


GLENN H. CURTISS BREAKING THE WORLD'S RECORD FOR QUICK STARTING



ROY KNABENSHUE FLYING OVER THE GRAND STAND IN HIS DIRIGIBLE

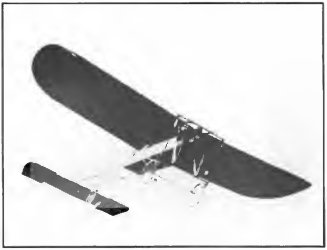
WILLIAM RANDOLPH HEARST, THE AMERICAN NEWSPAPER COLOSSUS, WAS THERE AND TOOK A RIDE WITH PAULHAN



CHARLES WILLARD IN A CURTISS MACHINE DID SOME GREAT FLYING

THE MAYOR OF SAN DIEGO PRESENTING PAULHAN WITH A LOVING CUP

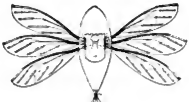
MEASURING ALTITUDE OF THE FLIERS WITH THE TRANSIT



MISCAROL, THE FRENCH AVIATOR, DRIVING A BLÉRIOT MONOPLANE

AIR, THE EMANCIPATION OF MAN

By V. L. Ochoa



PLAN OF THE OCHOA MACHINE, WHICH WILL BE MADE ENTIRELY OF STEEL.

H. O. N. plus Argyle and then Neon, and now we may still add, *magnetic flux*, as the element that gives it cohesiveness, capillary adhesiveness or (tenuity), or any other term you may wish to employ to denote its inseparability, when cleaved asunder, disturbed or disrupted.

The physicists will tell you that the pressure and the specific gravity makes the atmosphere inseparable. Where does the pressure come from? Is it from above the earth? and if so, what, then, is there below the earth to press that air up against the earth's surface? This, then, is a self-contradictory statement.

Is it not more reasonable to assume that the cause for this thing we call pressure is the now well-known magnetic lines of force known to exist and so palpably illustrated in the Aurora Borealis and Aurora Australis, when conditions are favorable for optical observation? These auroras, visually, show us really to what extent the magnetic lines of force extend.

They have, on many occasions, when conditions were favorable, shown to the naked eye their formed lines to extend from the poles to the equatorial zones. This, then, is an optical demonstration to us, of the ever-present magnetic lines of force, that we talk about but cannot very well prove.

Now, let us assume that magnetism is ever present, and we will then be able to explain phenomena heretofore baffling to man's understanding. To start with, we will take a cloud floating in the air. It floats on a cushion of hot air, as only in that way could it keep its load of vapor in a state volatile enough to float, otherwise the moment it is struck by a cold draft the vapor condenses and drops its water. Another thing happens; as the cloud is heavier, it does not quite float with the wind, it loses ground, as it were, the wind is ripped asunder at the forefront of the cloud, part of the air running down and part over it; as the wind is ripped in two, the magnetic lines of force in the air are severed. After a while enough magnetism is generated on the surface of the cloud to give off a spark—and this spark we call a bolt of lightning. As a rule this spark follows the moisture-laden air, or intermittent stream, caused by the on-rushing drops of water to the earth or from one cloud to another to which the damp vapor is blown or carried by the wind.

Magnetism in the air, or in the water, gives life to animated beings and causes disintegration in inanimate matter.

It will cause metals to disintegrate, whereas it will build up the body of an animal. How is it done? Very simply.

Look at a piece of iron exposed to the weather. You will say it has rusted away—into mere dust. Look at what is left of that iron. It is full of pits and holes, and next to each pit or hole is a little mound or ampula. A microscopic examination will reveal that the mound or ampula of rust was built up by the deposition of the particles of iron that flew out of the pit or hole and deposited themselves near by in a little mound. This could only have been made in one way—by magnetism. A magnetic eddy taking the particles of iron out, at the South Pole, and depositing them at the North Pole, is the only explanation for that pit and adjoining mound of rust.

In the case of life in the water, the magnetic eddies, as in the atmosphere, are ever present and ever, ever working. Let us take the simple cell of the slime and there we find the exact conditions existing in the atmosphere. As far as the microscope can show us, and the chemical analysis of the simple cell can be determined. It is shown that this cell is made up of a bit of carbon and particles of protoplasma, that grow by electrolytic aggregation and absorption, as each twenty-four hours pass by, much as the mound of rust, next to the pit, grows in the case of the iron exposed to the magnetic eddies of the atmosphere or water.

If the reader will please remember that many of our present electric cells are made with a bit of carbon and other protoplasmic pastes, with a reactive agent, to energize a current of electricity, he will thus see how near to ours is nature's own electric simplest cell.

I may mention that any two salts will suffice to energize the simple cells, and in the waters of the sea as well as in the liquids of the blood there are ample salts finding their way thither to energize and build ever and ever the simple cells that go to rebuild and reënforce the wasted cells destroyed by wear and tear in all animal life.

Now, having made an effort at showing how magnetism is the source of life of man, let us see how that same magnetism and air are to be the emancipation of man; simply this way: not only shall we make the wind give us power which we shall store up, in compressed air tanks, and convert into electric lighting, liquid air, all uses of power, and finally cheap means of communication.

In the great aerial highway man will emancipate himself from the upkeep of the present railroad bed, rolling stock, wear and tear of car wheels and cumbersome driving mechanisms. On the aircraft there will be no heavy nor expensive wheels to keep up, nor any other than the reasonable wear and tear of engines. Neither the wings nor the propeller of a flying machine suffer any wear as do the rubber tires of an automobile, or the wheels of a Pullman coach.

We are now carrying 100 pounds of weight one mile, at an expense of one-fourth of a cent, and before the year 1910 is over, I feel sure we can cut that to less than one mill per mile for every hundredweight.

If the railroads and automobile makers think they will be able to compete with such means of locomotion, I feel sure they will have very shortly to change their line of thought.

In the much despised and neglected oscillating wing machines, of which none have ever been made in a sensible and mechanical way, either for lack of means or for the lack of brains, and for the parsimony of civilization, and its neglectful and perfunctory governments, I have no doubt we will find the machine that will defy the elements, as they are now defied, even by the most feeble insect.

It has been said that the aeroplane is the nearest thing imitating the beautiful flight of the larger birds. There never was a statement made farther from the truth.

The aeroplane is thrust ahead by the impact of the propeller against the air behind it, and the planes lift the mass by mounting or continually creeping upon the embankment of air it meets. It does another thing, it creates a suction behind its great spread of plane surfaces. This suction, as well as the embankment in front, retards its progress. In other words, it vitiates or annuls, to a great extent, the work of the propeller.

In the case of the wings of a bird or of an insect, their operation is just the reverse. At each stroke the flexible feathers find an embankment of air behind, scooping it, as it were, and all the suction created is made to the front of the wing, thus utilizing every condition for the acceleration of its forward movement. Even its tail is utilized for lifting weight. How, then, can it be said the aeroplane is the duplication of nature's fliers?

We have aeroplane insects like the June bug and the beetle and all hard shell-wing insects, but they are all slow fliers, whereas all flexible wing insects are swift fliers—as is the honeybee, the locust, the dragon fly, etc.

So, all things considered, we may safely prophesy that where an aeroplane made sixty miles last year the wing machine will make many more this year.

AERIAL WARFARE

By Hudson Maxim

SINCE that long ago when the primitive savage crawled from the smoke and dinge of the hill-cavern and raised his eyes to the unfathomed mysteries of the great star-spangled concave, filled with winged life, flying with the day and hovering with the night, human aspiration, stimulated by imaginative wonder, has been the conquest of the air.

Man's admiration and his envy have always followed the bird in its flight, and though foot-tied to earth, he has in imagination soared in the cloud-land of the lark. His passion for flight has given wings to the immortal spirits of the dead, who, disburdened of this cumber of flesh and blood and bone, at last come to the realization of the dream of flight.

The skater, as he rides on glare of steel over the frozen glare, is, in fancy's pretense, riding on the wind. The cyclist, too, has his aerial fancies, and the automobilist in his flight with chance and death has the passion of the wing in him.

Now that the flying machine has actually come, we naturally stand a-tiptoe and peer into the future with a questioning surmise as to what will be its usefulness. Will it ever be broadly utilitarian?

Every invention has been forged out of necessity and there is not and never has been any other stimulus of genius so strong as that which has impelled man to prepare for war, demanding as it has and does the defense of country, home and loved ones on the one hand, and offering on the other the coveted rewards of conquest. Thus it is that the chief uses of human inventions from time immemorial have been as implements and enginery of war, for often it has been that a little lead of one people or country in war inventions has meant victory.

When the hair-snarled, low-browed, prognathous, primitive ancestor of ours looked down from his arboreal perch upon the life-and-death grapple of a fighting world, the imperative necessity for communication with his fellows for organization and co-operation to meet the exigencies of existence in an inclement environment of savage tooth and claw impelled him to employ certain sounds as the signs of ideas, which gave birth to language—the greatest and most useful of all weapons of war, and which lifted him from brute to man.

The human brain and the sword-arm have grown up side by side. The fingered hand has been forged from the fin of the fish by the same impulse that has builded the human brain upon the microscopic terminal ganglion of the primitive cordworm, infinitesimal piece by piece. Everywhere in nature the intelligently selective has grown out of blind inertia tending always toward the survival of the fittest.

It is an eternal, inexorable, impartial and merciless law of nature that all animal life must feed on other life. Every living creature has always been obliged to fight for place in its environment, and the fight of man for his higher place has been the severest contention of them all. He has had to fight a sterner fight for his uplift to a higher plane, in his war with heat and cold, with the hurricane and storm and flood, and with savage beasts and still more savage men.

Armed with a language and a club, the Alalus crept from his warren and entered the arena of life as man; and since that time he has hewn the living flesh from off the bones of every breathing thing and won the mastery of all the earth; and the fighting spirit in man has become a part of the very spirit of life itself, and we find it everywhere to-day, manifested in business as well as in war.

Though war be an evil, yet it is not always an unmixed one. Often war is a good thing, for to wars we owe the intermingling of peoples and the wider acquaintance of different groups and races of men with one another; and to the war spur we owe many of the master inventions and their wonder-working that have raised the world from savage indigence to luxurious enlightenment.

So it is, with the advent of the flying machine, we naturally look to its military uses as among those that will be the most important and that will give to the industry its strongest stimulus. Inventors will have to delve deep into the resources of their genius to produce flying machines to meet the stringent requirements of government specifications, for war is not a fair-weather game, but battles must be fought in the night and the storm, in high wind and low, as well as in calm air and daylight. It will be necessary to produce aeroplanes which will be capable of rising from any ground and traveling upon any air, however turbulent.

When there is a very strong demand for the accomplishment of a result through invention, that result is pretty sure of accomplishment if it lies within the range of human possibility; and I think that we may confidently expect the final building of aeroplanes that will enable the aeronaut to laugh at the wind and the storm,—aeroplanes which shall automatically hold their way, as the Whitehead torpedo holds its course, except for desired directing under the hand of the aeronaut.

The greatest usefulness which will be found for flying machines in the wars of the future will be as scouting craft and as carriers of raiders with the raiders' outfit of light arms and explosives; and the true use for explosives so carried will be in the blowing up of bridges, the destruction of magazines, arsenals and powder mills, and not, as is popularly supposed, as bombs to be dropped from a height.

Aerial bombs dropped from the sky will never be widely destructive, for it is contrary to the laws of nature that they should be, and nature's laws are hard to reverse.

There is a wide popular error about the force and action of high explosives. We often read of the invention by some obscure genius of a high explosive a hundred or a thousand times as powerful as dynamite, an ounce of which would wreck a block of buildings. Occasionally, a dynamiter or anarchist is arrested with a quantity of dynamite on his person, which is confidently asserted to be sufficient to utterly demolish a city square. Unfamiliarity with high explosives allows the imagination wide play which leads the public mind far into error.

It has been recently stated in the press that the advent of the flying machine seals the doom of the battleship, for now aeroplanes will be able to drop high explosives upon them and wreck them; and it was asserted that ten-pound bombs dropped from the sky upon a battleship would destroy it. As a matter of fact, it might rain ten-pound bombs for a week on a modern battleship without any other result than the marring of its paint and a few slight bruises on the superstructure. Such bombs would not even disturb the siestas of the marines below decks.

Bombs containing several hundred pounds of dynamite, however, dropped into the smoke-stacks or close beside a battleship and exploded near the hull below the armored protection, might do some wicked work, but this would be very difficult of accomplishment.

Obviously, a flying machine would have to travel high, in order to escape the sky-raking guns of a warship, which will be ready for the flying machine, as soon as the flying machine is ready, and must therefore be taken into consideration.

The flying machine must also travel at least thirty miles an hour in order to keep up. This means that it must be traveling forward at the time it drops a bomb at the rate of more than forty feet a second, and as the bomb would only travel sixteen feet the first second it was dropped, it would travel forward forty feet while dropping sixteen feet; and by the time it had fallen three hundred and thirty-six feet, it would have moved forward two hundred and forty feet; so that by the time a bomb had fallen from the height of a mile, it would strike pretty wide of the mark, unless the aeronaut should be skillful enough to drop it at exactly the right instant and several hundred feet before he came over the warship. This would certainly be a very difficult task, even if the warship were at anchor; but as the warship may itself be moving at nearly or quite the speed of the flying machine, the difficulty of hitting the warship would be increased still more.

A very wide use will be found for flying machines carrying raiders to wage war upon the unprotected population of interior towns, for the flying machine can pass over all barriers. Warships and coast fortifications, forts and armies, will fail to arrest its progress, but there will be of course flying machines of the opposing forces to bar the way.

In the next great war, along the frontiers of the warring powers will be hosts of aeroplanes perched ready to fly to the attack for the interception of any invading air fleet. Hill top and mountain height will watch the sea of air for aerial armadas as the coast hills of England watched the sea for the Spanish Armada.

Nevertheless, there will be aerial blockade runners that will elude detection and which will light upon and devastate unprotected cities and towns.

We must not imagine that in the next great war we will be permitted to sit by the hearthstone and read of the conduct of the war in distant parts, for aerial raiders of the enemy may at any moment come down from the sky and bring the latest war news right to our doors. The slumber of any night may be broken by the flare of the torch, the glint of the sword and the roar of conflagration. But, as I have said, the aerial bomb, dropping from the high air, will never be widely destructive, reports of imaginative writers notwithstanding.

A body of high explosive, detonated upon the surface of the earth, rebounds from the earth upward, expanding as it goes up in the form of an inverted cone, so that there is little action, and often none at all, to any considerable distance, on a horizontal plane. In order to do much damage, dynamite requires confinement in the thing to be destroyed, where it can exert its energy in disrupting its container. Then the damage it is capable of working is tremendous.

High explosive projectiles have been found to be quite ineffectual against troops, for the reason that their horizontal action is so limited; while, on the other hand, shrapnel and canister are very destructive because of their wide horizontal effectiveness, for the same reason that a bullet is more destructive having a flat trajectory than one that has a high trajectory. The bullet with the flat trajectory will strike a larger number of troops in its line of flight than a bullet having a more curved trajectory.

Obviously, an army marching rank behind rank would expose much more vital surface to the bullets of an enemy firing at them horizontally than they would if the bullets were fired at them from the sky, taking them head-on or end-wise, instead of sidewise, and where the bullet, even if it hit, could penetrate but one man; whereas the same bullet traveling horizontally might pass through half a dozen men.

The flying machine will be very useful as a scouting craft for the observation and mapping of an enemy's position and operations. The wars of the future will more and more be fought with science opposed to science.

THE RELATION OF WIND TO AERIAL NAVIGATION

By Professor A. Lawrence Rotch

THE prevailing direction and strength of the winds over the surface of the globe have been the object of study for many years. They are now quite accurately known and are entered on charts for the use of mariners, who are chiefly concerned with them as aids to navigation. The normal upper winds, which lately have been determined with some exactness by meteorologists, with a view of ascertaining the atmospheric circulation at different heights, become of interest to the aeronaut who wishes to make use of the more regular currents prevailing above the earth's surface. Consequently, the data which have been obtained at such aerological stations as Blue Hill now possess a practical as well as a scientific value.

The first measurements in America of the motions of the clouds were there made twenty years ago. By means of a triangulation from a base-line, the height, direction and drift of the various kinds of clouds were measured up to the level at which the highest ice-clouds, or cirrus, float, six to eight miles above the earth. These usually move from a westerly direction, little influenced by the storms at the ground, at an average speed of eighty miles an hour. But this method of determining the upper air-currents is not always available, for frequently there are no clouds, or, if there are, the lower clouds obscure the upper ones, and, in any case, it is not possible by them to measure the air-currents at successive heights at any particular time. This, however, can be accomplished by the use of pilot-balloons, triangulated like the clouds from a base-line. While small balloons have long been used by balloonists to determine the general direction in which they are likely to drift, it is believed that the first exact measures in America of pilot-balloons were made last summer at Blue Hill.

Even in cloudy weather, or at night, it is possible to obtain the general drift of the atmosphere up to heights of ten miles or more, by the so-called sounding-balloons, which carry automatic instruments that record continuously, height, temperature and the time. The first balloons of this kind were sent up from St. Louis in 1904 by the staff of the Blue Hill Observatory, and when they fell to the ground hundreds of miles away, all but four of the seventy-six dispatched were found and returned to the senders. Knowing the place at which the balloons fell, and having a record of the height during the flight and its duration, the average direction and speed of drift could be calculated. These showed a general movement from the west-northwest at the rate of 25 miles per hour for a mean height of 6,500 feet, and at a rate of 56 miles per hour for a mean height of 20,000 feet, which is rarely attained by manned balloons.

Thus it is evident that, in these latitudes, the aeronaut who maintains an altitude of two miles or more will be carried eastward, in most cases, with the speed of an express train.

The surface winds in most parts of the world are too irregular to be of much service to either the spherical or dirigible balloon which are unable to sail into the wind like a ship, but north and south of the equator the trade-winds blow steadily from the northeast and southwest respectively, rarely influenced by cyclonic disturbances. To ascertain the upper winds in these low latitudes, a steam-yacht, provided with balloons and kites, was sent to the South Atlantic a few years ago by M. Teisserene de Bort and the writer. Measurements of the angular altitude and direction of the balloons from the deck of the vessel showed that at a height varying from a quarter of a mile to a couple of miles the surface winds were completely reversed, the northeast trade becoming southwest and the southeast becoming northwest. These results have just been confirmed by the observations of a German colleague, Professor Hergesell, in the Caribbean Sea, where a very strong southwest wind was found to be superposed on the northeast trade-wind, three miles or more above the ocean.

Hence it appears possible for a spherical balloon, starting from the African coast, to sail far out over the Atlantic, and, by rising into the upper current, return safely to land.

A more dangerous feat would be for a balloon starting from the southern West Indies to seek first the upper southwest current, trusting to the northeast trade for the return journey.

The impossibility of keeping a balloon in the air for several days would make a transatlantic crossing, from the United States to Europe, in the upper westerly current, a hazardous undertaking.

Aeronauts and aviators, however, are more particularly interested in the wind conditions prevailing within two or three miles of the earth, and for the Atlantic coast states the data which have been obtained with kites at Blue Hill Observatory since 1894 furnish this information.

The best way of measuring wind velocity within the stratum mentioned is by means of an anemometer attached to a kite which can be kept at a nearly constant height over the ground station for many hours at a time.

The increase in wind velocity with height above the ground is found from these records to be very rapid. At night it is faster and attains a maximum at the height of a third of a mile, above which there is a decrease in velocity, except in winter, up to two-thirds of a mile. Above that level there is little change between the day and night conditions and the velocity continues to increase up to the regions occupied by the highest clouds, where, as we have said, it blows on the average eighty miles an hour, and sometimes in winter at double that speed. On account of the diminished density of the air at this elevation, however, the pressure of the wind becomes only one-quarter of that for the same velocity at sea-level.

The diurnal change in the velocity of the wind is also of interest. At the ground the highest velocity occurs in the afternoon and the lowest velocity early in the morning, but in the free air these conditions are completely reversed at the height of a quarter of a mile. Near the ground the wind is more gusty on account of the obstacles it encounters, which may be compared to reefs on the sea-coast producing breakers. At night, because of the absence of ascending currents, the wind is much steadier than during the daytime, and in summer, a region of little wind suitable for aviation, which is also warmer and drier than either in the daytime or on the ground, may be found about 4,000 feet above it. In this way, then, the aerologist, although himself remaining on the earth, may aid the aeronaut and aviator perform aerial journeys, looking to them in return to advance the exploration of the air.

AEROPLANES AMONG PLANTS AND ANIMALS

(From Harper's Weekly Advertiser)

THE "men birds" who have solved the heavier-than-air problem have not attained the possibilities of the lower animals who rise in the air by muscular power, nor are the birds and the "winged mice" (bats) the only flying animals. There are others, and those others deserve more credit for their effort because they do their work without the aid of artificial motors.

Some of the mammals give themselves the appearance of parachutes by spreading a slack skin carried by them on both sides of their flanks. The skin joins the front legs to the back legs and maintains the animal in the air during his flight. Such maintenance is nothing less than flat flight, the flight of an "aeroplane" ("air-flat").

The flying squirrel, or Norfolk squirrel, of New North Wales, is an example of the animal aeroplane. This little animal affects the society of men, lives in small families in the trees, and feeds on vegetable substances and on insects. He hides in the tree-tops, rolled like a ball, in a knot-hole, or in the crotch formed by several branches, and sleeps wrapped in his membranous skin as in a mantle. At nightfall he awakes, spreads his sails, and leaps in the air with surprising agility. In the light he is as inanimate as a bat; he sleeps all day, awaking from time to time to eat a little, but when night falls he moves so swiftly that the human eye cannot follow his movements. He is as agile as a monkey. He has been known to spring thirty-three feet into the air and leap to a distance of one hundred and two feet.

The flying-dragon of the Sunday Islands is the aviator among reptiles. He carries large membranous expansions on his flanks. The two membranes when spread form a parachute which he uses whenever his keen eyes spy an insect on a distant tree.

Flying-fishes may be classed as aviators who fly by means of aeroplanes. They do not fly as the bird flies—that is to say, they do not beat the air with their wings. Their fins do nothing but maintain them in the air by flat flight—the flight of the air-plane.

The most common of amphibious aviators leaps from the sea and soars in the air to a distance of from eighteen to twenty feet. In some of his greatest leaps he moves in an arc of from twelve to fourteen feet. When his momentum gives out he falls back into the water to gather strength for another flight. These unfortunate amphibious aviators are forced to fly to escape the teeth of the fish who hunt them.

In the warm regions of the Atlantic and Pacific oceans, and even in the Mediterranean, another flying-fish is found. This is the "sea-swallow," a creature so like a bird in appearance that it is impossible to think of him as a fish. He flies close to the water because the warm air dries his fins and makes high flight impossible. He is a fish, therefore his fins must be kept wet, for all his power is drawn from the sea. Like the glow-worm, the sea-swallow emits phosphorescent light.

Living aeroplanes, some no larger than the smallest gnats, are found among the shell-fish of the crab and lobster family. Under a strong magnifying-glass they show tails ending in feathers. Their locomotor appendices are furnished with plumes of hairs so long and so numerous that it is evident that they were created to be spread as a means of augmenting the body's surface so as to enable the little beasts to maintain themselves in the air. They dart to the surface of the water, leap in the air, soar, and fall back. Their movement is a long spring or jump rather than a flight.

Nature has given other animals other means of sailing the air. The white gossamer which rides the autumn wind is a species of airship used by the animals who spin the silvery threads, drawing them so fine and light that they are seen floating in the air more than sixty miles from land. Gossamer threads are spun by different kinds of spiders. Naturalists who have watched the spinners at their work have seen them climb to the tops of trees and there build their web, which the lightest wind carries onward and on it the spider that spun it. Scientists have expressed astonishment that no inventor has applied the spider principle to aviation.

The vegetable world shows aviators of merit. Even the pollen of certain plants is an agile and indefatigable traveler on the wind. By means of the wind plants sow their seed for miles around. The plants which send their seed broadcast on the wind are, in their way, manufacturers of very successful and practical aeroplanes. The most frequent aviatory arrangement is made by the tree fruits, called by naturalists, "the wind-lovers."

The fruit of the elm-tree is provided with an envelope of very light membranous tissue which forms a wing; that of the maple has such a membrane, but it has it on one side only. The fruit of the birch-tree has two side pieces which act as wings. That of the clematis is drawn out in a long, silky, plume-like arrangement which seems to have been created for nothing but aviation. Unquestionably these appendices were given trees and plants to enable seeds to travel on the wind and sow themselves at a distance from their starting-point.

PROMINENT AMERICAN WOMEN

Who are Interested in the Science of Aviation

MRS. HUGO C. GIBSON
of New York

MRS. J. HERBERT SINCLAIR
of New York

MRS. G. W. CROSSMAN
of New York

MISS MARY E. CLEMENT
of Philadelphia, Pa.

MRS. NICHOLAS LONGWORTH
of Washington, D. C.

MISS KATHERINE WRIGHT
of Dayton, Ohio

BIG MEN OF THE MOVEMENT

HUDSON MAXIM

HUDSON MAXIM, inventor, mechanical engineer and student of aeronautics, was born at Orneville, Piscataquis County, Maine, February 3, 1853. He is the son of Isaac and Harriet Boston (Stevens) Maxim.

Hudson Maxim left school at twenty-five years of age, after completing his academical studies at Kent's Hill, Maine, where he paid special attention to chemistry, engineering, and the natural sciences. In 1873 he formulated the hypothesis of the compound nature of so-called atoms, which has become a generally accepted theory only within the past few years, as a result of experiments on radiant matter. Mr. Maxim's theory was published in the Scientific American Supplement in 1889. He was engaged in the printing and subscription-book publishing business in Pittsfield, Mass., from 1883 to 1888, and of one book of which he was the author, entitled "Penwork Self-Instructor," nearly 300,000 copies were sold. He took up the business of ordnance and explosives in 1888. In 1890 he built a dynamite factory and smokeless powder mill at Maxim, New Jersey, a place named for him, where he developed the first smokeless powder to be adopted by the United States Government. In 1897, he sold the smokeless powder inventions to E. I. du Pont de Nemours and Company, Wilmington, Delaware, and since 1898 has been consulting engineer and expert in the experimental department of that company. In 1901, he sold to the United States Government the secret of his invention known as Maximite, the first high explosive to be fired through heavy armor plate. This explosive at once placed the United States in the lead of all nations in the use of high-explosive projectiles. He is also the inventor of a detonating fuse for high-explosive projectiles, which has proven the most successful of any fuse yet developed. He has recently perfected a new smokeless powder of his invention, known as Stabillite, which has many advantages over any other form of smokeless powder. He is the inventor of a new system of driving automobile torpedoes of the Whitehead type, by means of a self-combustive material known as motorite, by which much longer range and speed than heretofore is made possible. He invented the process now in general use in the United States for making calcium carbide continuously by the electrical resistance of a molten carbide conductor, removing the carbide as fast as formed, and simultaneously supplying fresh material to the heating field. This process was purchased by the Union Carbide Company in 1906.

He was married in 1896 to Lilian Durban, daughter of the Rev. Wm. Durban, M.A., a well-known linguist and litterateur of London, England. He is a member of the Military Service Institution; the Society of Chemical Industry; the American Association for the Advancement of Science; the Chemists' Club; the New England Society; the Navy League, and the Brooklyn Institute of Arts and Sciences.

CORTLANDT FIELD BISHOP

CORTLANDT FIELD BISHOP was born in New York City, November 24, 1870. In 1891 he graduated from Columbia University, A.B.; Ph.D., 1893; Columbia Law School, 1894.

He is a member of a great many clubs and associations throughout the world, among them being the Bar Association of the City of New York, American Museum of Natural History, National Academy of Design, Society of Colonial Wars, Columbia University Alumni Association, and the Metropolitan, City, Grolier, Collectors, Knickerbocker, Automobile Club of America, Automobile Club of France; but all these are secondary in his estimation to the Aero Club of America.

When the automobile made its appearance, Mr. Bishop was one of the first to become interested, and when conditions were such that progress was possible in aeronautics he immediately became as much interested in this new science as he had in the automobile.

The Aero Club of America was but a few months old when Mr. Bishop became its President. The greater part of his time is spent in working in the interests of the Aero Club of America, and last summer while abroad, so as to be able to be of even more value to the Club, he accepted the office of Vice-President of the Internationale Aeronautique Federation.

The first Gordon Bennett International Aviation Cup Race was to be held at Rheims to decide the aviation championship, and as the date fixed for the contest drew near there was much anxiety in America because of the fact that no American aviator was available, the Wright Brothers being too much occupied in their business and the expense being prohibitive for anyone else. It was then that Mr. Bishop came to the front and guaranteed the expenses of Mr. Curtiss and the transportation of his machine. As a result, Mr. Curtiss went to Rheims and won against the most skilful aviators in Europe. When the time came for America to send a representative to participate in the Gordon-Bennett International Balloon Race at Zurich, America found herself in the same predicament she had been at the time of the International aviation contest.

Again Mr. Bishop guaranteed the expenses of Pilot E. W. Mix, and another great victory for America was the result.

At the present writing Mr. Bishop has returned home after representing the Club at Los Angeles, a large part of the great success of this meeting being due to his work in conjunction with the Aero Club of California, one of the clubs affiliated with the Aero Club of America.

Mr. Bishop has offered his resignation as President of the Aero Club of America on a number of occasions, so that some one else could take up the work, and on each of these occasions the entire membership of the Club arose and persuaded him to keep at its head.

SAMUEL PIERPONT LANGLEY

SAMUEL PIERPONT LANGLEY, the famous astronomer and physicist, and third Secretary of the Smithsonian Institution, was born on August 22, 1834, at Roxbury, Mass. He took up civil engineering and architecture for a profession, but abandoned these pursuits in 1864 and built a telescope together with his brother. A year later he was made assistant astronomer at the Harvard College Observatory. In 1866, after a brief stay at the United States Naval Academy at Annapolis, he was called to the Western University of Pennsylvania as professor of astronomy and physics and director of the Allegheny Observatory at Pittsburg. This position he held for 20 years, and his scientific labors in connection with it, one of the first being the standardization of time both in this country and Europe, gained him an international reputation, and induced Professor Baird to invite him to the Smithsonian Institution as assistant secretary. In 1887, on Professor Baird's death, he was elected its chief executive officer.

His first public utterance on aerodynamics was a very brief communication to the Academy of Sciences of the Institute of France, in July, 1890; his second, a lengthy memoir in the Smithsonian Contributions to Knowledge; and his third, a popular account of the possibility of aerial flight, in the Century Magazine. His great work, "Experiments in Aerodynamics," was republished in French and attracted wide attention. He followed it up with a second great work, in 1893, entitled "The Internal Work of the Wind."

His first successful flight was made in 1896 with an aerodrome model driven by steam. This machine flew three-quarters of a mile over the Potomac River. In 1898 he built a flying machine by direction of the Board of Ordnance and Fortification of the United States Army, who appropriated the funds for that purpose.

He continued his experiments with the gas engine as a motor power, publishing his results in a brief paper in 1905. The trials of the test models were successful, but the two attempts made to launch the large machine, on October 7, 1905, and again on December 8th of the same year, were failures. This was due, in Langley's opinion, not to any defect in the machine itself, but to the lack of means to continue the work properly. But it made him the subject of hostile attack by the newspapers of the country, and this public misapprehension of his labors broke his spirit, and he died at Aiken, S. C., on February 27, 1906.

For his general scientific work he was the recipient of many honors. He received degrees from the Universities of Oxford and Cambridge in England, and from Harvard, Princeton, Michigan and Wisconsin in this country; and was awarded medals by the National Academy of Sciences, the Royal Society of London, the American Academy of Arts and Sciences, the Institute of France, and the Astronomical Society of France.

BIG MEN OF THE MOVEMENT

A. LAWRENCE ROTCH

A. LAWRENCE ROTCH, born in Boston, 1861, S.B., Mass. Institute of Technology, A.M. Harvard University, Professor of Meteorology in Harvard University. Founder and Director of Blue Hill Meteorological Observatory, where the earliest measurements in America of clouds were made in 1890, and the first self-recording instruments lifted by kites in 1894, reaching the unprecedented height of three miles in 1900. This method of exploring the air is now extensively used at meteorological observatories everywhere.

In 1901 kites were, for the first time, flown over the ocean, the motion of the steamer serving to create an artificial wind sufficient to lift the kites in calm weather.

In 1904 sounding-balloons with instruments were sent up under his direction at St. Louis to the height of ten miles, recording the temperatures at this and intermediate heights.

Recently the atmospheric currents were measured with pilot balloons eleven and a half miles above Blue Hill. The only sounding-balloons yet used in the East are those sent up by Professor Rotch from Pittsfield, Mass.

As early as 1880, Mr. Rotch made two balloon ascensions from Paris to test the accuracy with which temperatures were recorded automatically, and subsequently made ascensions from Berlin, Strasburg, Milan and London.

In 1896 he helped to found the International Commission for Scientific Aeronautics, which executes aerological observations simultaneously throughout the world, and is an original member of the permanent International Aeronautical Commission, organized also at Paris in 1900, to consider technical questions relating to aeronautics.

Professor Rotch is a corresponding member of the Berlin Aeronautical Society, and received the Orders of the Prussian Crown and Red Eagle, Third Class, in recognition of his work in exploring the atmosphere. It may be mentioned that in the colored plate, designed by Colonel Moedebeck for the German schools, and entitled "Pioneers in Aeronautics," the only Americans included are Professor Rotch and his early co-citizen, Dr. Jeffries.

Professor Rotch is a member of the Aero Club of the United Kingdom and an original member of the Aero Club of America.

He was the first President of the Aero Club of New England, is now President of the newly-organized Harvard Aeronautical Society, and as Chairman of the Section of Mechanical Science of the American Association for the advancement of Science, he will invite the attention of engineers to aeronautics.

Besides numerous scientific articles, Professor Rotch has published "Sounding the Ocean of Air" (Romance of Science Series), London, 1900, and "The Conquest of the Air" (Present Day Primers), New York, 1909.

CAPTAIN THOMAS S. BALDWIN

CAPTAIN THOMAS S. BALDWIN, the Zeppelin of America, was born on June 30, 1855, in Marion County, Miss.

His first aeronautical achievement, that of making the first successful parachute jump in the world from a balloon, took place at Golden Gate Park, San Francisco, on January 30, 1877. This was followed by balloon ascensions and parachute leaps all over the world, and in 1888 William H. Le Fevre, C. E., President of the Balloon Society of Great Britain, said of his work: "I am of the opinion that Captain Baldwin has made one of the greatest discoveries in the practical application of aeronautical science, I mean the practical application of the science so as to realize results which previous to the invention of his parachute seemed to be absolutely unattainable." And Baldwin was presented with the first gold medal ever awarded by that Society.

In 1892 Baldwin made his first attempt to construct an airship. This was a combination of the balloon, the bicycle, and the screw propeller, but he found that his own power was hardly sufficient, and it was impossible at the time to secure a suitable motor for the purpose, the gasolene motor being then in its infancy. He was unable to produce a power-driven machine until 1902, when he removed a 24 horse-power motor from his automobile and installed it in his airship. When the ship was tested it rose from the launching frames, but the operator found it impossible to control the affair. It was an airship, but not of the dirigible class. Then followed more months of experimenting, and it was in 1904 that Baldwin made his first conspicuous success. On August 2nd, on the outskirts of Oakland, he drove into the wind with his ship, turned, and came back with it to the starting point. Then rapidly in succession he produced one successful dirigible after the other.

His crowning success was the recognition given him by the United States Government, when, in 1908, it purchased from him its first airship. The requirements seemed impossible to fulfill, which made his success all the greater. During the past few years Baldwin had experimented constantly to produce a gas-holding material which would stand all kinds of weather and from which no gas could escape. When he received this contract from the Government he had produced such a material in the way of a vulcanized rubber. The Government has since adopted this material for its spherical balloons, and sportsmen likewise recognize its superiority. Baldwin's work in connection with the producing of the Curtiss aeroplane is also recognized by all, and the world is looking forward eagerly to the day when Baldwin will construct a heavier-than-air machine embodying wholly his ideas gained by his vast experience. Captain Baldwin is a charter member of the Aero Club of America and one of the most popular men in the movement today.

DR. OCTAVE CHANUTE

DR. OCTAVE CHANUTE, popularly known in America as the "Father of Aeronautics," was born at Paris, France, on February 18, 1832. When he was only six years old he came to this country with his parents, and spent his boyhood in New York, being educated in the private schools of that city. In the early fifties he went West as a railroad engineer. In 1863 he was appointed engineer-in-chief of the Chicago and Alton Railroad, and in this position he was active in the development of the railroads of the Middle West. In 1873 he became chief engineer of the Erie Railroad, a position that he held until he was elected president of the Chicago Tie Preserving Company, ten years later.

Among other offices he has held are those of Vice-President of the American Society of Civil Engineers; Fellow of the American Association for the Advancement of Science; President of the Western Society of Engineers. He is an Honorary Member of the Canadian Society of Civil Engineers and in the Institution of Civil Engineers of Great Britain, and is a member of the Century Club of New York.

Dr. Chanute has been a frequent contributor to various engineering journals, and he is also widely known as the author of the volume "The Kansas City Bridge." But of greater interest to the aeronaut is his book, "Progress of Flying Machines," which first appeared serially in the pages of *The Railroad and Engineering Journal* (later called *The American Engineer*). Beginning with the October installment in 1891, it ran through twenty-seven issues of the magazine, and was then collected in book form. His object in writing this book was, according to his statement in the preface, to satisfy himself whether with the mechanical knowledge and appliances then at hand, especially with the light motors then coming into use, it would be possible in time for men to fly through the air. Second, to bring together a record of previous experiments and failures, for the benefit of aviators, who might thereby be saved needless waste of effort in experimenting with unsuitable devices. Third, to give an account of recent achievements and to set forth the principles involved in the flying machine, so that an investigator might judge intelligently of new devices submitted for examination. The value of this work lies in the fact that Dr. Chanute was one of the first to sum up the status of aeronautics down to his own time, thereby providing inventors with a starting point for new departures in the art of aerial navigation. And he was far sighted enough to realize the value of aeronautics at a time when the art still stood on a very insecure footing.

He was the constant and helpful friend of the Wrights in their early experiments, and later he had the great satisfaction of witnessing Orville Wright's first successful trials at Fort Meyer.

THE INTERNAL WORK OF THE WIND

By S. P. Langley

By Courtesy of the Smithsonian Institution

IT has long been observed that certain species of birds maintain themselves indefinitely in the air by "soaring" without any flapping of the wings, or any motion other than a slight rocking of the body; and this, although the body in question is many hundred times denser than the air in which it seems to float with an undulating movement, as on the waves of an invisible stream.

No satisfactory mechanical explanation of this anomaly has been given, and none would be offered in this connection by the writer, were he not satisfied that it involves much more than an ornithological problem, and that it points to novel conclusions of mechanical and utilitarian importance. They are paradoxical at first sight, since they imply that, under certain specified conditions, very heavy bodies entirely detached from the earth immersed in, and free to move in, the air can be sustained there indefinitely, without any expenditure of energy from within.

These bodies may be entirely of mechanical construction, as will be seen later, but for the present we will continue to consider the character of the invisible support of the soaring bird, and to study its motions, though only as a pregnant instance offered by Nature to show that a rational solution of the mechanical problem is possible.

Recurring, then, to the illustration just referred to, we may observe that the flow of an ordinary river would afford no explanation of the fact that nearly inert creatures, while free to move, although greatly denser than the fluid, yet float upon it; which is what we actually behold in the aerial stream, since the writer, like others, has satisfied himself, by repeated observation, that the soaring vultures and other birds appear as if sustained by some invisible support, in the stream of air, sometimes for at least a considerable fraction of an hour. It is frequently suggested by those who know these facts only from books, that there must be some quivering of the wings, so rapid as to escape observation. Those who do know them from observation are aware that it is absolutely certain that nothing of the kind takes place, and that the birds sustain themselves on pinions which are quite rigid and motionless, except for a rocking or balancing movement involving little energy.

To the writer, who has himself been attracted from his earliest years to the mystery which has surrounded this action of the soaring bird, it has been a subject of continual surprise that it has attracted so little attention from physicists. That nearly inert bodies, weighing from 5 to 10, and even more, pounds, and many hundred times denser than the air, should be visibly suspended in it above our heads, sometimes for hours at a time, and without falling—this, it might seem, is, without misuse of language, to be called a physical miracle; and yet, the fact that those whose province it is to investigate nature have hitherto seldom thought it deserving attention is perhaps the greater wonder.

The "turkey buzzard" is so plenty around the environs of Washington that there is rarely a time when some of them may not be seen in the sky, gliding in curves over some attractive point, or, more rarely, moving in nearly straight lines on rigid wings, if there be a moderate wind. On the only occasion when the motion of one near at hand could be studied in a very high wind, the author was crossing the long "Aqueduct Bridge" over the Potomac, in an unusually violent November gale, the velocity of the wind being probably over 35 miles an hour. About one-third of the distance from the right bank of the river, and immediately over the right parapet of the bridge, at a height of not over 20 yards, was one of these buzzards, which, for some object which was not evident, chose to keep over this spot, where the gale, undisturbed by any surface irregularities, swept directly up the river with unchecked violence. In this aerial torrent, and apparently indifferent to it, the bird hung, gliding, in the usual manner of its species, round and round, in a small oval curve, whose major axis (which seemed toward the wind) was not longer than twice its height from the water. The bird was therefore at all times in close view. It swung around repeatedly, rising and falling slightly in its course, while keeping as a whole on one level, and over the same place, moving with a slight swaying, both in front and lateral direction, but in such an effortless way, as suggested a lazy yielding of itself to the rocking of some invisible wave.

It may be asserted that there was not only no flap of the wing, but not the quiver of a wing feather visible to the closest scrutiny during the considerable time the bird was under observation, and during which the gale continued. A record of this time was not kept, but it at any rate lasted until the writer, chilled by the cold blast, gave up watching and moved away, leaving the bird still floating about at the same height in the torrent of air, in nearly the same circle, and with the same aspect of indolent repose.

If the wind is such a body as it is commonly supposed to be, it is absolutely impossible that this sustentation could have taken place in a horizontal current any more than in a calm, and yet that the ability to soar is, in some way, connected with the presence of the wind became to the writer as certain as any fact of observation could be, and at first the difficulty of reconciling such facts (to him undoubted) with accepted laws of motion seemed quite insuperable.

Light came to him through one of those accidents which are commonly found to occur when the mind is intent on a particular subject, and looking everywhere for a clue to its solution.

In 1887, while engaged with the "whirling-table" in the open air at the Allegheny Observatory, he had chosen a quiet afternoon for certain experiments, but in the absence of the entire calm, which is almost never realized, had placed one of the very small and light anemometers made for hospital use in the open air, with the object of determining and allowing for the velocity of what feeble breeze existed. His attention was called to the extreme irregularity of this register, and he assumed at first that the day was more unfavorable than he had supposed. Subsequent observations, however, showed that when the anemometer was sufficiently light and devoid of inertia, the register always showed great irregularity, especially when its movements were noted, not from minute to minute, but from second to second.

His attention was aroused to these anomalies, he was led to reflect upon their extraordinary importance in a possible mechanical application. He then designed certain special apparatus hereafter described, and made observations with it which showed that "wind" in general was not what it is commonly assumed to be, that is, air put in motion with an approximately uniform velocity in the same strata; but that, considered in the narrowest practicable sections, wind was always not only not approximately uniform, but variable and irregular in its movements beyond anything which had been anticipated, so that it seemed probable that the very smallest part observable could not be treated as approximately homogeneous but that even here there was an internal motion to be considered, distinct both from that of the whole body, and from its immediate surroundings. It seemed to the writer to follow as a necessary consequence that there might be a potentiality of what may be called "internal work"[*] of the wind.

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[*] Since the term "internal work" is often used in thermodynamics to signify molecular action, it may be well to observe that it here refers not to molecular movements, but to pulsations of sensible magnitude, always existing in the wind, as will be shown later, and whose extent and extraordinary possible mechanical importance it is the object of this research to illustrate. The term is so significant of the author's meaning that he permits himself to use it here, in spite of the possible ambiguity.

On further study it seemed to him that this internal work might conceivably be so utilized as to furnish a power which should not only keep an inert body from falling but cause it to rise, and that while this power was the possible cause of the action of the soaring bird, it might be possible through its means to cause any suitably disposed body, animate or inanimate, wholly immersed in the wind, and wholly free to move, to advance against the direction of the wind itself. By this it is not meant that the writer then devised means for doing this, but that he then attained the conviction both that such an action involved no contradiction of the laws of motion, and that it was mechanically possible (however difficult it might be to realize the exact mechanism by which this might be accomplished).

It will be observed that in what has preceded it is intimated that the difficulties in the way of regarding this, even in the light of a theoretical possibility, may have proceeded, with others as with the writer, not from erroneous reasoning, but from an error in the premises, entering insidiously in the form of the tacit assumption made by nearly all writers, that the word "wind" means something so simple, so readily intelligible and so commonly understood as to require no special definition while, nevertheless, the observations which are presently to be given show that it is, on the contrary, to be considered as a generic name for a series of indefinitely complex and little known phenomena.

Without determining here whether any mechanism can be actually devised which shall draw from the wind the power to cause a body wholly immersed in it to go against the wind, the reader's consideration is now first invited to the evidence that there is no contradiction to the known laws of motion, and at any rate no theoretical impossibility in the conception of such a mechanism, if it admitted that the wind is not what it has been ordinarily taken to be, but what the following observations show that it is.

What immediately follows is an account of evidence of the complex nature of the "wind," of its internal movements, of the resulting potentiality of this internal work, and of attempts which the writer has made to determine quantitatively its amount by the use of special apparatus, recording the changes which go on (so to speak) *within* the wind at very brief intervals. These results may, it is hoped, be of interest to meteorologists, but they are given here with special reference to their important bearing on the future of what the writer has ventured to call the science of aerodromics.[*]

The observations which are first given were made in 1887 at Allegheny, and are supplemented by others made at Washington in the present year.[†]

What has just been said about their possible importance will perhaps seem justified, if it is remarked (in anticipation of what follows later) that the result of the present discussion implies not only the theoretical, but the mechanical possibility that a heavy body, wholly immersed in the air and sustained by it, may, without the ordinary use of wind, or sail, or steam, and without the expenditure of any power except such as may be derived from the ordinary winds, make an aerial voyage in any direction, whose length is only limited by the occurrence of a calm. A ship is able to go against a head-wind by the force of that wind, owing to the fact that it is partly immersed in the water, which reacts on the keel, but it is here asserted that (contrary to usual opinion and in opposition to what at first may seem the teachings of physical science) it is not impossible that a heavy and nearly inert body, *wholly* immersed in the air, can be made to do this.

The observations on which the writer's belief in this mechanical possibility are founded will now be given.

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[*] From ἀεροδρομέω, to traverse the air; ἀεροδρόμος, an air-runner.

[†] It will be noticed that the fact of observation here is not so much the movement of currents, such as the writer has since learned was suggested by Lord Rayleigh so long ago as 1883, still less of the movement of distinct currents at a considerable distance above the earth's surface, but of what must rather be called the effect of the irregularities and pulsations of any ordinary wind within the immediate field of examination, however narrow.

See the instructive article by Lord Rayleigh in Nature, April, 5, 1883. Lord Rayleigh remarks that continued soaring implies: "(1) that the course is not horizontal; (2) that the wind is not horizontal; (3) that the wind is not uniform." "It is probable," he says, "that the truth is usually represented by (1) or (2); but the question I wish to raise is, whether the cause suggested by (3) may not sometimes come into operation."

To be continued in April AIRCRAFT

LAW AND THE AIR

By Denys P. Myers

FRANCE has called a conference to determine the rules by which the nations will be guided in their navigation of the air. At this writing neither the date nor place nor any of the preliminaries of the conference have been thoroughly considered, but sooner or later the conference will be held, will emit a code—and there will be a body of law to govern the air internationally.

Already Paul Fauchille in France, Friedrich Meili in Switzerland, and Friedrich Gruenwald in Germany, have published monographs on the juridical régime that will obtain in the aerial domain; in this country the *American Journal of International Law* is soon to publish some articles on the subject, and lectures upon the topic are beginning to be given.

It is, therefore, timely that AIRCRAFT, in its first number, begin a consideration of what rules the aeronaut will have to respect. Since in most countries, especially Europe, flight will readily disregard boundaries and become an international affair, the question begins to loom large in the prospective law of nations, and particularly is the extent of a nation's, or state's, jurisdiction in the ether, to employ the technical word, forging to the front.

How far up, then, can a state exert its jurisdiction? The answer is simple: As far as it can. But if that were the whole story books would not be in process of construction on the subject. And, in fact, that dictum only defines the point where the difficulty starts. For dirigibles and aeroplanes have both been driven higher than the highest structures yet reared by man, Comte de Lambert having flown at least 200 feet higher than the Eiffel Tower, the tallest building of the world. Orville Wright, Latham, and the unfortunate Fernandez have ascended 1,640 feet in the air, far beyond the count's mark. The dirigible prefers to travel at a height of about a mile (5,280 feet) above the surface of the earth. Even many cannon fail to ascend their shells that high, and doubtless aeroplanes will shortly dare to go beyond their range.

So much for the problem. Writers and thinkers generally find the legal solution of the difficulty in setting a limit beneath which a flying machine may not come. Here enters the analogy of the sea, which in many respects resembles the domain of the air. It is uninhabitable in a continuous manner, is not susceptible to being occupied in the way a homesteader stakes a claim on land, and so cannot be possessed or appropriated. This much cannot be gainsaid.

But no sooner have the legal authorities agreed upon this than they begin to diverge in theory. One set say, we grant the air cannot be occupied or appropriated by the state lying beneath, but neither can it be subjected as a whole to the authority of any other state. So, by default of other ownership, possession must be an attribute of the subjacent state. They add that this simple solution removes many difficulties and, in time of peace, inures to no one's harm. But, assert the other school, since you cannot possess the air in a real and continuous manner, it cannot be argued that it must of necessity belong to anybody. Ownership is not usually proved that way. To be sure, the doctrine of the hinterland has been asserted in late years, but that, reduced to its lowest terms, simply means that, by occupation of a coast in a region fit for colonization, a state may thus obtain a favored position which shall result in keeping other states from effecting possession of territory in that region and leave the hinterland state free to make its title to the interior good.

The latter school seems to have the better of the argument, for in the last hundred years the other argument has been pretty thoroughly disproved by actual usage. England once asserted control over every sea that touched her coasts, but finally assumed the more modest attitude of claiming jurisdiction over only three nautical miles of it from low water mark.

It is therefore fairly certain that some such arrangement will be decided upon for the air. The basis of the three-mile limit for the sea is the carriage of a cannon shot in the old days when the limit was established. Why not transfer the same test to the air? A claim to the right to rule over such a portion of the atmosphere as can be commanded by artillery is obviously an enforceable one.

The question that now arises is, how far does such a sphere extend upward? Information sufficiently exact to be considered final does not yet exist on the point, but from various sources it is considered that a range of two miles vertically represents the extreme. Doubtless the specially constructed Krupp gun can carry farther, but no definite reports of its tests are at hand.

Be that as it may, the range is great enough to bring every aeroplane within the danger line and reach everything else that flies when within the customary zone; for the favorite height of a dirigible seems to be about one mile.

By this time the reader is very likely wondering why it is of consequence whether the subjacent state owns one mile or too miles into the air. Possession determines legal jurisdiction and also responsibility. An act committed aboard a vessel on the high sea, beyond the three-mile limit, comes within the competence of the courts of the state to whose citizens the ship belongs. The same act committed in a foreign port would come within the jurisdiction of the courts of the state to which the port belonged. General agreement among civilized countries renders this principle automatic, to the effect that no ship is ever outside of the jurisdiction of some court, and the captain is never in doubt as to what jurisdiction applies. The case is precisely analogous to the situation that will obtain in the air.

But there is more to the story. The United States does not know what the fear of espionage is, but in Europe, where the nations correspond in size to our federal states, the dread of prying neighbors is acute. Inasmuch as Europe by reason of its many states has a large voice in international councils, its difficulties are bound to receive full attention in the making of international laws. So espionage as a force must be reckoned with.

A moment's thought will convince anyone that of all methods of espionage observation from the air above is the safest, easiest and most efficient for most purposes. In war and peace so much depends on knowing the arrangement of troops, guns mounted in forts and elsewhere, that a camera in the hands of a capable aeroplanist becomes a great menace. As a result the nations are already of the opinion that the flying machine will be not only indispensable, but that each state must take extreme precautions against its successful use by its enemies. At the basis of the problem is the primary consideration, Is an aviator equipped for observation as a spy?

The legal ground upon which the definition of spy is built makes deception a necessary quality of the individual. Now an aviator cannot conceal himself, to a great extent cannot work clandestinely. But the danger from his kind is so great that it is certain the definition will be revised to include him among the spies, especially if his credentials are not entirely satisfactory.

Every state is going to defend itself against espionage as a matter of self-preservation, and that circumstance suggests that a protective zone, such as the marine three-mile limit may be established by international agreement. Eyesight being so defective as compared with photography that it gives only a fleeting and imperfectly remembered glimpse of an object, this sphere will doubtless be based upon the focal range of such combinations of the lens and telescope as will be developed for the express purpose. The range of the telephoto camera under satisfactory conditions is, I believe, now something like a mile for detailed work such as espionage observations naturally would be.

It seems probable that inventors will direct their attention to this problem, and that the limit of practical range will be shifted from time to time. As a consequence, the proximity to a fortified place of an aeronaut not giving indications of official or innocent purposes would undergo modifications. There will, however, be little doubt that the first agreement on the subject will forbid unaccredited aeronauts from approaching less than a mile from military works.

One thing remains sure: navigation of the air will not be left unrestricted by the nations. It is more than probable that the rules now in force for navigation of the sea will be drawn upon largely in constructing a code for the air, but in the nature of the case no zone of protection against aerial travellers could be fixed so precisely or for so long a time as the now obsolete three-mile limit relative to coastal waters of a state.

To be continued in April AIRCRAFT

ALEXANDER'S OPINIONS

MR. PATRICK Y. ALEXANDER, of London, England, who has given the last twenty years of his life studying and promoting the science of aeronautics, and who has visited almost every country in the world in the interests of the aeronautical movement, spent an interesting hour in the editorial department of AIRCRAFT recently.

Mr. Alexander has a thorough grasp of the whole aerial subject, and is just as much interested in the success of the movement in Japan, China, France or any other country as he is in the propaganda work done in his own land.

He aided the movement during its inception in the United States to a large extent by giving valuable advice to the American pioneers as well as contributing to the science generally.

It is Mr. Alexander's opinion that France leads the flying machine world from a practical standpoint, but that England is away ahead of that country theoretically.

He thinks Germany has spent too much time in developing the "lighter-than-air" craft to the exclusion almost entirely of the heavier-than-air vehicles. Japan, he says, is taking a wonderful interest in the movement, but is apparently keeping secret most of its discoveries.

Mr. Alexander is of the opinion that the motor will eventually be discarded for the propelling force of flying machines and the natural forces do that work altogether. Small motors may be used, however, on the larger aircraft for the purpose of steering, etc. He also thinks that within the next few years wonderful ships of the air will be plying between the different cities and countries of the world.

He takes a great interest in educating the boys of England in this new science, and gives periodical lectures, illustrated by magic lantern slides, of gliders, flying machines, etc., at the United Services College, Windsor, England, where there are one hundred boys interested in the subject.

The Hampshire Aero Club, which also has about one hundred boy members, is getting lectures frequently by Mr. Alexander, as well as the East London College.

He thinks that within three years' time at least fifteen thousand boys of England will be able to fly; in fact, he is of the opinion that boys will take the greatest part in the development of the science, they having more time to devote to it and less fear of getting into smash-ups than men usually.

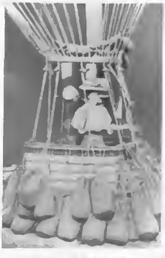
Mr. Alexander thinks that the movement has now taken root in the United States, and that this country within the next three years will rank among the great aeronautical centers of the world.

Mme Édouard Surcouf

Mme Albert C. Triaca

Mme Alice Politis

Some Prominent European Sky Women



Mme May Harbord in the basket of her balloon Walkyrie in which the aeronaut crossed the English Channel

Mme Gaby Carter

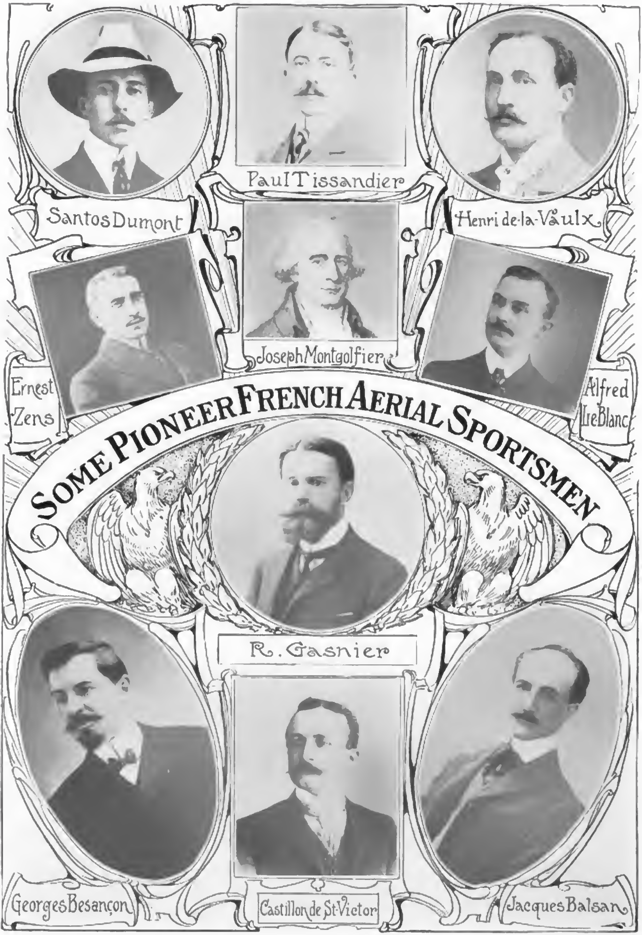
Mme Georges Besançon

Mme Marie-Anne Lafaurie

Mme Lucien Saunion

Mme Albert Omer-Decugis

SOME PIONEER FRENCH AERIAL SPORTSMEN



FOREIGN NEWS

By Albert C. Triaca

AUSTRALIA.—The Department of Defense of Australia has offered $25,000 to the inventor of a flying machine adjudged by the minister for defense to be the best and most suitable for military purposes.

The inventor must have been a resident for at least two years and be a British subject. The machine, so far as possible, must be constructed in Australia.

AFRICA.—At the aero contest near Heliopolis, in Egypt, which takes place during the week of February 6th to 13th, there will be present fifteen of the most eminent aviators in the world. Latham will fly his Antoinette, the Baroness de la Roche in a Voisin biplane, Mortimer Singer, a daring Englishman, in a Farman machine, De Riemsdyck in the Curtiss biplane, and Hans Grade in the monoplane, which he recently flew in Germany. The Baroness de la Roche has never flown in public before. The aviators all purpose to fly around the Sphinx if possible.

Even Tangeers, notable to the traveller for its archaic conditions, has been invaded by the flying machine. The other day Olieslagers, formerly a Dutch motorcycle man, flew about over the city of Oran for fifty-four minutes. The excitement among the veiled beauties of the harems and the beturbaned male population of the city is said to have been so great that the priests, who govern the city, have forbidden any more exhibitions.

BELGIUM.—At Brussels, Belgium, several aeroplanes, Bleriot, Antoinette and a great number of home-built apparatus were exhibited at the motor show which opened January 15th.

ENGLAND.—In England a prize of $5,000 has been offered by Mr. Patrick Y. Alexander for a twenty-four-hour aeroplane motor. The engine must develop not less than thirty-five horse-power and its weight not exceed 245 pounds. In making the award these points will be considered: Weight of petrol, petrol consumption, reliability and steadiness of running, wear on working parts, security against fire, air resistance offered, etc., by the motor.

The Aerial League of the British Empire is enlisting volunteers to aid in aerial signaling and in assisting aviators. This volunteer force is intended to take active service in case of war.

The utmost secrecy has been maintained concerning the new naval airship which is being built at Barrow, England, for the British Government. The British airship will have a length of over 500 feet—about 170 yards. The motors will be Wolseley engines of eight cylinders, developing 200 horse-power each. With this driving force the speed of the airship is calculated at forty-five miles an hour.

The Hon. C. H. Rolls accomplished a fifteen-mile continuous flight across country, Leysdown to the Near Club, on the island of Sheppy, in his Wright biplane.

Mr. Grahame-White made a wager that he would fly from a point down the River Thames to within a mile of the heart of London with his Bleriot monoplane.

FRANCE.—Count Lambert intends to fit a cellular tail of the Voisin type to his Wright aeroplane.

Although the great Astra airship is now ready and could make the voyage from Paris to London at any moment, it has been decided to postpone her voyage until after the general election. Originally it was intended that she should make it before Christmas. The Daily Mail Garage at Wormwood Scrubs is ready for the reception of the huge airship.

The sporting daily paper of Paris, *L'Auto*, which has promoted for several years on the Tuileries Garden an annual contest for small pilot balloons for children, will hold this year, in February, the Gordon-Bennett Cup for aeroplane models in the same place.

ITALY.—At Rome is planned an aviation exhibition next March under the auspices of the Societa Aeronautica Italiana.

GERMANY.—Count Zeppelin had a sad Christmas. He had just been notified that the Government will not purchase his airship, Zeppelin III. He had expected to receive $140,000.

The War Office says the employment of a new metal lighter than aluminum, called electrum, in the making of airships would make the Zeppelin III. out of date. Count Zeppelin's health is not good.

The first successful flights of three different types of aeroplane of purely German construction took place on February 2d. A biplane, with the inventor, Echler, and his assistant, made a flight of a short distance at Landau, but the assistant's nervousness was the cause of a slight accident. The machine is built to carry six.

At Essen a biplane under the control of Herr Hilsmann made eight short flights, while at Herken a monoplane constructed on the new Schulze-Herfort system flew two hundred yards.

Eight months ago, on a night when the Zeppelin dirigible lay a wreck, the German Aerial League was started, and a national subscription was opened. This has now reached the sum of nearly $2,000,000 to advance the cause of aviation in Germany, and provide the nation with an aerial fleet for war purposes. The league has also established a school of aeronautics at Friedrichshafen, in addition to the chair of aeronautics at Gottingen University.

Count Zeppelin, whose aerial flights in dirigible balloons have attracted world-wide attention, is planning a monster airship capable of carrying 900 persons, and which it is proposed to use in a passenger service to be established between Hamburg and London. A service will also be maintained from Hamburg to Cologne and Baden Baden.

Vigorous opposition to the Wright aeroplane patents is threatened by German aviators. The matter was fully discussed at a meeting recently of the Deutscher Flugtechniker in Berlin. Major von Parseval suggested that a member of the association should bring action against the German company which exploits the Wright patents. This would force the issue. Then German aviators in general would be accurately informed and guided in the manufacture and use of their respective systems. Herr Grade declared that nothing on his plane could be construed as an infringement of the Wright patents, and the general opinion expressed was that Wright patents were subject to considerable doubt. It was finally decided that a special committee should take the matter in hand, establish a test case and bring it before the courts for a decision, which would settle the matter.

The German Zeppelin and Parseval companies are negotiating for co-operative aerial passenger service.

Widespread interest in aviation is illustrated by the fact that Dr. Karl Voll Moller, a German poet, and Rev. Mr. Sydney Swann, an Englishman, have provided themselves with aeroplanes.

The Parseval Airship Co. (Munich) will commence, on May 1st, a series of airship excursions with a dirigible of 250,000 cubic feet. The voyage will last three hours; a distance of 90 miles will be covered, and the fare will be $50.

All records for distance, duration and altitude are held by Count Zeppelin, with his monster airship, the Zeppelin III. On March 13th he attained a height of 5,200 feet, and on May 29th he covered 870 miles in thirty-seven hours.

The German Government, it is expected, will finance Professor Hergesell's airship expedition to the North Pole. Two airships, to be constructed by Count Zeppelin, are to be used. One is to be left at a relief station to be established at Spitzbergen; the other is to be used in making excursions, keeping in touch with the relief station by means of wireless telegraphy. Professor Hergesell has just reached New York.

HUNGARY.—Hungary is beginning to have real flights. A Dr. Kutassy has recently bought a Maurice Farman aeroplane and succeeded in flying at Budapesth for about 5 kil.

SWITZERLAND.—Exhibition flights are promised for some time in January in Switzerland. Count de Viry will prepare an aerodrome near Geneva, to encourage Swiss aviation. Already there are six aeroplanes in the country, of which one is that built by the makers of the Dufaux motor, which has already made short flights.

TURKEY.—The Turkish army decided to organize aviation sections in the three first army corps.

The Dirigibles of the World are To-day Fifty-two

AMERICA.—War dirigible No. 1, built by Captain Thos. Baldwin. Six small dirigibles for show purposes, owned by Knabenshue, Beachey and Strobel.

BELGIUM.—La Belgique II., built in Paris by Goodard, owned by R. Goldsmith.

La Friandre, "under construction."

ENGLAND.—"Non-rigid type," military dirigible baby, for experimental purposes.

"Under construction, non-rigid":

A war dirigible of 7,000 m. 3, speed 32 miles per hour, is being built in Astra works. Pattern Colonel Renard.

"In preparation," three dirigibles.

FRANCE.—"Non-rigid type": Ville de Paris; 3,200 m. 3, speed 28 miles per hour.

Clement-Bayard, 3,500 m. 3, speed 29 miles per hour. Owned by Astra works.

Ville de Nancy.

Ville de Bordeaux, 3,000 m. 3, speed 29 miles per hour.

Colonel Renard, 7,000 m. 3, for the French Government.

Zodiac No. I., No. II., No. III. (of Zodiac works), 750 m. 3, 900 m. 3, 1,200 m. 3, with speed varying from 14-24 miles per hour.

"Semi-rigid type," Le Jaune, built by Lebaudy Bros., 2,500 m. 3. Military training airship.

Liberte, for the War Office.

"In preparation": Spiess dirigible, Malecot dirigible, mixed balloon-aeroplane system.

GERMANY.—"Non-rigid type": Parseval type, No. I., 2,800 m. 3, speed 26 miles an hour. Imperial Aero Club.

Parseval type, No. II., 4,000 m. 3, speed 28-30 miles per hour. War Office.

Parseval type, No. III., 5,600 m. 3, speed 33 miles per hour. War Office.

Parseval type, No. IV., 1,200 m. 3 (speed not given). Imperial Aero Club.

Clouth, 1,750 m. 3, speed 21 miles per hour.

Rhenish-Westphalian Motor Airship Co., 2,900 m. 3 (resembles the French type Ville de Paris, built by Astra Co.).

"Semi-rigid type": Military airships (designed by Major Gross), 1907, experimental dirigible, 1,800 m. 3, speed 26 miles per hour.

Military No. 1, 5,500 m. 3, speed 26-28 miles per hour.

Military No. II., 5,500 m. 3, speed 26-28 miles per hour.

Ruthenberg, 1,200 m. 3, speed 24 miles per hour.

"Rigid type": Zeppelin No. I., 13,000 m. 3, speed 24 miles an hour. War Office.

Zeppelin No. II., 15,000 m. 3, speed 28 miles an hour. War Office.

Zeppelin No. III., 15,000 m. 3, speed 33 miles per hour.

"Non rigid type. Under construction":

Siemens-Schuckert, 13,000 m. 3.

"Rigid type": Schutte, 20,000 m. 3. Belongs to the German Aerial Navigation Co.

"In preparation": Unger. Steel dirigible.

Prill. Steel dirigible.

Rettig; with the balloon cover made of five wooden plates.

ITALY.—"Semi-rigid": Military dirigible, 2,500 m. 3, speed 27 miles per hour.

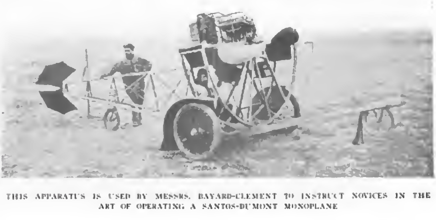
"Non rigid": Da Schio dirigible, 1,200 m. 3.

Leonardo da Vinci (built by Forlanini, is a mixed rigid, not rigid, type).

"In preparation": Two war dirigibles.

RUSSIA.—A war dirigible (built by Lebaudy Bros.; type Republique).

SPAIN.—Dirigible "Espana" (built by the Astra works; type Colonel Renard).



THIS APPARATUS IS USED BY MESSRS. BAYARD-CLEMENT TO INSTRUCT NOVICES IN THE ART OF OPERATING A SANTOS-DUMONT MONOPLANE

NEWS IN GENERAL

By Mrs. J. Herbert Sinclair

AN opportunity of viewing all the different types of aircraft will be afforded the public when the first National Exhibition of Aerial Craft will be held in Mechanic's Building, Boston, Mass., February 16th to 23d, under the personal direction of Chester I. Campbell and sanctioned by the Aero Club of New England and the Aero Club of America.

Mr. Charles J. Glidden is Chairman of the Advisory Board for the Exhibition, and such well-known men as Professor W. H. Pickering of Harvard University, Professor David Todd of Amherst College, H. Helm Clayton, Luke J. Minnehan, President of the Pittsfield Aero Club, N. H. Arnold of North Adams, Chas. J. Shean, President of the Springfield Aero Club, A. Holland Forbes, Vice-President of the Aero Club of America, Professor A. Lawrence Rotch of Boston, Hon. John Barrett of the Aero Club of Washington, D. C., and A. B. Lambert, President of the St. Louis Aero Club, will serve on the Board.

Among the many entries so far arranged for are Captain Baldwin's immense dirigible, 125 feet in length and an exact replica of the first dirigible sold the Government. The celebrated "Boston" balloon, the "All America," and others from the different aero clubs, as well as a most complete exhibit by Aeronaut Leo Stevens, will also be shown. Among the full-size, heavier-than-air machines will be a Bleriot, a Latham, an Antoinette, a Wright model and other types. Hundreds of flying models will be sent from all over the country, including exhibits of the West Side Y. M. C. A. of New York, the Junior Aero Club of New York, Columbia and Harvard Universities and many individuals.

The exhibition will open at 8 P. M., Wednesday evening, February 16th, after the first day opening at 10 A. M. daily, closing February 23d.

Reginald Weatherby, of Spanway Lake, eleven miles from Tacoma, has achieved a triumph of aviation. After three years of experimenting, which gives him high rank as an aeronaut, he has completed and successfully tried out his aluminum aeroplane. The new feature of the Weatherby machine is a substitution of a system of undulating planes for the ordinary revolving propeller, by means of which the inventor has demonstrated a speed of 120 miles an hour without vibration or jar, if the newspaper reports are to be believed.

C. F. Lowe, of Pasadena, Cal., who sailed a balloon from Cincinnati, Ohio, to the coast of South Carolina, made a record in 1861 of more than 750 miles in twenty-four hours, which has not been surpassed.

Captain John Berry, of St. Louis, Mo., is at work on an airship which promises well. The mechanism differs from any that has heretofore been tried on dirigibles. It is designed to give to the pilot control of a balloon of the ordinary construction. On an upright shaft, twelve feet in height, are set propeller blades and rudder blades controlled by levers. The power is transmitted from a motor at the base of the shaft, which is to rest in the basket. The blades are of aluminum, 8 x 18 inches in size. The weight of the entire mechanism is 150 pounds. He is satisfied that it will do the work it is intended to do as it is, but he plans to substitute a 10 horse-power motor for the 2 horse-power motor now attached. He expects to use with it a 17,000 cubic feet balloon.

Messrs. Preble & Rekar, of Portland, Ore., are busy building an airship which they expect great results from, and when completed will do as they claim, and more. The Russian Government has offered $3,000,000 for the patents if the airship can make a flight of 1,000 miles.

A. Harrison, of Wichita, Kan., has already produced a machine which promises to prove an entire success in the field of aerial navigation. Up to the present time the only power used has been developed by the navigator himself, using geared bicycle pedals to drive the propellers. In this way he has only been able to drive the fans at the rate of from sixty to seventy-five revolutions per minute. He is now attaching a 5 horse-power gasolene engine, with which he expects to drive the fans at the rate of from 300 to 400 revolutions per minute, thus furnishing enough power to keep the machine in the air as long as desired. Mr. Harrison's machine is rather more of a monoplane than a biplane, the main plane of the machine is 27 x 14 feet in size, having two wings which fold down when not in use. The steering will be accomplished by two sets of practically horizontal fans before and behind the machine. These fans range from 3½ x 7 feet to 4 x 8 feet in size. The frame work is of second-growth pine and the machine is mounted on three bicycle wheels. The propeller has four blades, each eight feet long and eighteen inches wide. Driven by the engine, it should produce a wind effect of from ten to twenty miles per hour, which will keep the machine up at will. The present weight is thirty-five pounds, and the engine will weigh thirty-six pounds more.

Mrs. Edgar Reagen, of San Antonio, Tex., has had an airship built in the shops of Messrs. Merrill & Keisen, 206 North Haliday Street, Baltimore, Md. The machine, the inventor says, will travel at the rate of 130 miles an hour. It is on the multiplane type. The craft is of aluminum and will be propelled by an eight-cylinder Curtiss engine, and will have an air space of 700 feet. The weight is only 600 pounds, and the machine will carry four persons.

J. H. Klassen, of Los Angeles, Cal., is building a monoplane that has a supporting surface of 240 square feet, and will weigh 400 pounds fully equipped. This machine is thirty feet long and thirty feet wide. He will equip the machine with a 20 horse-power, four-cylinder, air-cooled Curtiss engine with a 3½-inch bore and 3½-inch stroke. The propeller is seventy-two inches long and five inches wide.

Mr. De Witt C. Dorman, of Monot, N. D., has built an aeroplane with the absence of planes. It has all propellers, eight blades being attached to the frame. The owner said he believed his machine was capable of maintaining any speed which the operator desired, and that it would even hover over a given point for any length of time. On rising, he said, it would go straight up without moving along the ground.

J. A. McCullum, President of the Midland Electric Co., Kansas City, has constructed a flying machine which has a thirty-two foot span, a five foot four inch cord or breadth, and weighs 550 pounds. In appearance it is very much like the Curtiss plane. Mr. McCullum has been interested in the navigation of the air some years, and although only thirty-one years of age has made many models of flying machines.

J. W. Curzon, of New Orleans, La., is now building an aeroplane for his sisters of which much is expected. It is called the "Boudoir" size, and the Curzon sisters will have a 90-lb. engine in their machine.

Mr. Otto Herman, of Providence, R. I., believes he has solved the aerial problem. He has invented a machine on the biplane type, in which he will make his first flight shortly.

Frank P. Lahm says that the aeroplane will be a valuable addition to the army in the near future, but even as the machine stands to-day it is fitted for splendid work on the battlefields.

A design for an automatically balanced aeroplane has been made by Everhard H. Boeckh, of Washington, D. C. He has two gliding models of the machine at his home. Boeckh is but a boy, and some time ago patented designs for a monoplane.

Ernest Walschendorf, of West Reading, has completed a flying machine weighing seventy pounds, to carry three persons and operated by compressed air.

John W. Hudson and Clifton O'Brien, of Oakland, Cal., have invented a monoplane almost a replica of the famous machine in which Bleriot, the French aviator, crossed the English Channel, with the exception of the engine, which is an entirely new model designed and built by Mr. Hudson.

Norbert Obrecht, of Pontiac, Mich., who has been engaged for the past six months in constructing an airship, is now putting the finishing touches on it, and expects to fly before summer.

Mr. Henry Stoddard, Secretary of the Speedwell Motor Car Co., is interested in flying machines, and will build the first plant in Dayton, O., devoted to that purpose, getting it under roof and in operation by the first of May.

Chas. A. Wilson, of Goodland, Kansas, and Wm. I. Purvis, of Illinois, have invented a gyroplane. So engrossed are the inventors in putting their machine to a more complete test that both have resigned their positions with a railroad company, and the people of Goodland are going to support them to the end that they may have means for building a perfectly equipped gyroplane after their ideas.

David Williams, of Yale, Mich., has invented an airship that will not only sail in the air, but on water as well, and even travel on land. The date of his trial trip has not been set.

W. B. Strong, owner of the Kansas City Olathe Interurban R. R., made the following statement: "I am not done with the flying machine business yet, but propose to hold an aerial meet in May or June and offer cups, and prizes for speed, height and distance flying.

Stanley Beach, of Stamford, Conn., has nearly completed a new monoplane which is somewhat similar to the Bleriot machine but much lighter, weighing only 500 pounds. The engine is a 25 horse-power, water cooled, and weighs about 250 pounds. Mr. Beach contemplates organizing a company in New York with a capital of $50,000.

Edgar S. Smith, of Los Angeles, Cal., is nearing the completion of a very small aeroplane, which he calls the "Dragon Fly" No. 2. It is a double monoplane similar to the Langley type. It is eighteen feet wide and twenty feet long, with a supporting surface of 160 square feet. The total weight in flying order, including the operator, will be about 350 pounds. The body is made of spruce reinforced with steel tubing, while piano wire is used in guying.

Mr. Parker Lyon, ex-Mayor of Fresno, Cal., is greatly interested in a machine owned by one of the Fullers in San Francisco, and which is much the same as those used by the Wright Brothers. This machine is of about 90 horse-power, and has a carrying capacity of four passengers.

Frederick Loy, Washington, D. C., has invented a new type of biplane. The machine is octagon shaped and longer than it is wide. In this man-carrying machine, of the type which Mr. Loy intends to build, there will be a speed of 700 square feet of supporting surface. It will be thirty feet wide and will weigh about 700 pounds.

Work is being carried on by A. H. McCarthy, of San Leandro, Cal., Superintendent of the Best Iron Works, on an aeroplane, the design of which he has been working over for some time. Mr. McCarthy, who has already constructed a model of the airship which he claims is an exact replica of the proposed machine, claims that it flies. The aeroplane is of the pattern of the Wright machines. Horizontal planes furnish the chief wind resistance. A 50 horse-power motor will be installed to furnish power for the two propellers which will pull the contrivance through the air.

Two monoplanes are nearing completion, one by Messrs. Frank & Warren and Professor Twining. The machines are moulded out of McAdamite metal, which is claimed to be the strongest and yet the lightest metal on the market. The engines will be a 50 horse-power, four-cylinder, water-cooled type and will turn 1,800 revolutions a minute.

Messrs. Beachy & Knabenshue, of Los Angeles, Cal., are building a biplane to weigh 425 pounds fully equipped, and is planned along proven lines with several original improvements. The frame work is of spruce throughout; stranded cable and piano wires are used for guying. The motor power is furnished with a four-cylinder Curtiss engine, which develops 15 horse-power and is air cooled. The engine is calculated to drive a five-foot spruce propeller at the rate of 10,000 revolutions a minute. The machine is twenty feet long and twenty-eight feet wide and has a supporting surface of 180 square feet. The main planes are 28 by 4½ feet and are placed four feet apart and are set at an angle of six degrees.

Paul and Henry Elliott and Gilbert Smith, of Fort Scott, Kan., are building a flying machine. The machine is not an original invention—they do not claim that they have originated any important new features—they have taken the monoplane of Santos Dumont and Bleriot as models, and after a careful selection of the best features of each, have constructed a machine of their own. They enlarged on the Dumont model and gave their machine 120 square feet of canvas. This is less spread of wings than the Bleriot ship, which crossed the Channel, had. The main wing of the machine has a spread of 6 x 20 feet and the tail has twenty-seven square feet. The machine without the engine will weigh between 100 to 150 pounds. The propeller on the machine has two seven feet blades; the seat for the driver is below the propeller. The Bleriot stabilizing planes will keep the car nearly level, automatically. With a moderate weight engine and a man weighing 150 pounds, the total weight of the machine will be less than 400 pounds.

At the National Aircraft Exhibition, to be held at Boston, February 16th to 23d, Mr. Edward Durant, Director Junior Aero Club of America, will exhibit aeroplane models of various designs. There will also be models made by members of the Aeronautic Society and others.

Among those who will exhibit are Percy Pierce, Walter Phipps, Ralph S. Barnaby and Bryan Battey.

Among the adults, Mr. W. M. Sage, J. K. Dalkranian and A. Reaud will also exhibit models.

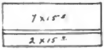
SOARING POWER *versus* MOTOR POWER

By R. Dressler

IN order to overcome the difficulties presented by aerial navigation, we must follow the guidance of nature: first, we must place the weight below the supporting planes (as in the Santos-Dumont monoplane), and, second, we must adopt a soaring power, instead of the unreliable motor power. A few instances from nature will serve to illustrate the principle.

A vulture measures 6 feet from tip to tip, weighs 15 pounds, and develops a soaring power equal to nearly 2 mechanical H.P., minus weight. When it is about to rise into the air, it faces the air current, jumps, stretches out its wings, and then ascends, without any further wing motion, to a height of about 3,000 feet, gliding up and down about ten times, while its wings seem perfectly motionless. An albatross weighs about 20 pounds, more or less, and his wings measure 14 feet from tip to tip, with an even width of 8 inches. This famous sailor develops a soaring power nearly equal to 3 H.P., without vibrating his wings. If it wants to rise from the water on a windy day it can do so without wing motion, while on a calm day it must beat its wings a few times in order to attain the necessary momentum for soaring. It is so well balanced that it can go to sleep resting on its wings without awakening until some air current carries it down to the water, when it awakes, adjusts its balance, and sails upward again to take another nap.

1

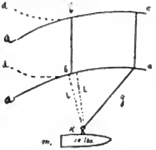


Storks, cranes, wild geese and other long-legged soaring birds of heavy weight, in changing their domicile in the spring and autumn of every year, soar up to a height of 2,000 miles in one stretch, vibrating their wings only when they want to go faster than merely soaring would permit them.

The rear part of the wings and tails of soaring birds is very flexible, and bends upward under the pressure of their weight as they rest on the air, forming a body of propellers which develops 1 H.P. or more for every ten pounds of weight. For instance, if a vulture weighed only one pound, it could not soar up and overcome gravity, but would flutter in the air like a butterfly.

The above statements may be easily verified by the simple soaring fliers here illustrated. Please note and compare the action of the rear part, which I call soaring blades. Fig. 1 represents a room soarer. Take a piece of light-weight cardboard 7 by 15 inches, or any other size, and paste over the rear part a piece of glazed newspaper 2 by 15 inches, bend the front part a little upward, and drop it (don't shove it) from a height of about 10 feet; notice the increase in forward motion as it flies through the room, propelled by the piece of paper, which acts somewhat as a soaring blade. If it does not balance correctly, bend the soaring blade up or down until you get the right action, as the force of the soaring blades always tends to push this flier forward. If the blade is bent down, the soarer will carry some weight—for instance, a pencil pasted on near the blade.

2



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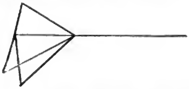

Fig. 2 represents a mechanical albatross, Fig. 3 being its tail. Make a glider of two planes, each 1 by 5 feet, of rattan; for the cross-ribs, which are spaced 3 inches apart, take whalebone, such as is used in corsets. Make the overhanging rear part 4 inches from *a* to *b* and point them off toward the end point *a*. When this machine floats in the air the rear has to assume a line as *d* to *b*. These whalebone rods do the propelling very effectively. Cover the two decks with pongee silk. A rattan rod about 2 feet long, *g*, runs from *e* to *k*, which is held in position by the two lines *l l* from each corner *b* to *k*, and at the end *k* a ten-pound weight is fastened. This weight must be adjusted until you have the right supporting angle, and the weight then keeps the flier at this angle. Place the rudder in position and have everything well balanced. If you drop this machine from a height of 40 feet, it will first fly forward in a downward direction, and as soon as it has gained speed enough for support it will fly in an upward direction and overcome gravity. Or push it against a wind current, holding it by a reel, and then let go. If badly balanced, it will fly in circles

4

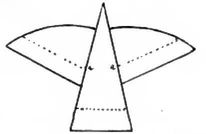

Fig. 4 represents a vulture. Down to *a a* it is rigid, and below the dotted lines it is flexible.

These experiments show how soaring is effected. They prove that heavy bodies soar better than light bodies; that a weight is needed to overcome gravity; that ten pounds of air pressure produce a motor power equal to one mechanical H.P., and that one square foot of curved surface and one linear foot of flexible surface will outbalance gravity equal to two pounds of weight. It also proves that man can imitate the flight of birds, and devise a soaring machine that will enable him to travel anywhere, using the weight of his body to produce a soaring power to overcome gravity.

As soaring blades maintain the impetus indefinitely, the soaring power is nothing more or less than gravity, shifted and guided by connecting planes into other directions, as downward; or, a falling body pushed sideways and also slightly upward.

CLUB NEWS

Aero Club of America

By Charles H. Heitman

FOR many years prior to the organization of the Aero Club of America the science of aerial navigation had received careful study in Europe. Many Americans had seen balloons pass over Paris daily, and many of them had made balloon ascensions abroad and were eager to engage in the sport more frequently, and to do so in their own country.

In the summer of 1905 the subject was discussed with great interest by members of the Automobile Club of America; it was realized that if these workers could be brought together in one body where they could compare notes and exchange the knowledge gained by their efforts, it would insure much more rapid progress; it was also suggested to start a club, such as the Aero Club of France, to offer facilities for its members to make ascensions, etc.; aeronautics as a sport would also benefit very largely, and as a result the Aero Club of America was born.

In January, 1906, the club's first real work was done when it organized its first exposition. Balloons were imported from Paris, and the public were given an opportunity to see what they were like. Photographs of balloon ascensions were displayed and an effort was made to arouse a popular interest in the sport as it is practiced abroad.

This show was followed by a number of actual ascensions, and many persons became familiar with aerial navigation in its simplest and safest form. The club located at Pittsfield, Mass., a station combining the features necessary for successful ascents—distance from the sea and an abundant supply of coal gas.

Two balloons were then purchased from Count Henri de la Vaulx, one of them, the Centaur, having made the record balloon journey from Paris to Russia in 1900, still the world's record for distance, and these balloons were rented to members at a very moderate cost.

In order to throw safeguards about this sport it became necessary for the club to adopt rules governing the issuing of licenses to those who have proved themselves capable of handling balloons. The club requires a strict course of training before it grants a license to an aerial pilot, and at the present time thirty such licenses have been granted to pilots in all parts of the country, so that balloon ascensions may be made in many places piloted by capable men. The club from its birth believed in encouraging ballooning as the most practical means of studying the air and stimulating public interest in aerial navigation, and it feels that it has acted wisely.

The Aero Club of America was fortunate in being organized in time to become one of the original members of the Federation Aeronautique Internationale, which was founded in 1905, and is composed of the leading aero clubs of all nations. This organization is in reality an international federation of aeronauts, as its name implies. It holds an annual conference in some one of the world's capitals, and the number of delegates from each club is proportioned to the number of cubic meters of gas consumed in its ascensions during the previous year, and the number of flights made in heavier-than-air machines.

It was to this body that James Gordon Bennett presented for competition his International Challenge Cup, and it was under its auspices that the first contest for this cup was held, on September 30, 1906. The honor of winning this cup fell to the Aero Club of America, represented by one of its honorary members, Lieutenant Frank P. Lahm.

As a result of this victory it devolved upon the Aero Club of America to organize and hold the contest for this International Trophy in 1907. St. Louis, because of its favorable location and its excellent gas facilities, was selected as the city to hold the race, and St. Louis successfully accomplished its task. There were nine contestants, Germany represented by three, France by two, England by one, and the United States by three, and Oscar Erbsloh, representing Germany, succeeded in carrying off the much-coveted cup and cash prizes, making an American record for distance, 872.253 miles, landing at Bradley Beach, N. J. Alfred Le Blanc, representing France, gained second place, landing at Herbertsville, N. J., a distance of 866.867 miles, and making a new world's record for duration—44 hours and 3 minutes in the air.

As a further stimulus to ballooning, the Aero Club of America founded and offered for competition a challenge trophy, known as the Lahm Cup, held in turn by each pilot who exceeds the record of the previous holder of the cup. But not only did the Club carry out the one purpose for which it was founded, that of stimulating interest in aeronautics as a sport in this country, but it has also always given encouragement and recognition to inventors in every way it possibly could. In 1906 the club investigated the work being done by the then unknown Wright brothers, and published a report laying before the public for the first time their achievements. In the fall of 1907 the club held its second aeronautical exposition, giving the public an opportunity to witness the state of the science at that time. The club has held an annual banquet in 1907, 1908 and 1909 at the Hotel St. Regis, and each marked the rapidly increasing interest.

The club holds the magnificent Scientific American Trophy for competition by heavier-than-air machines, which will become the permanent property of the aviator who wins it three times. A flight of one kilometer was required for the first competition, and this was won on July 4, 1908, by Glenn H. Curtiss, representing the Aerial Experiment Association.

A flight of twenty-five kilometers was required for the second competition, and this was won by Glenn H. Curtiss on July 17, 1909, on the Club's grounds on the Hempstead Plains, Long Island.

Aeronautic Society of New York

By Lee S. Burridge, President

THE Aeronautic Society of New York was organized on June 10, 1908, and was formed for the practical pursuit of the problem of mechanical flight by man. Its objects were briefly set forth as follows:

In General.—To advance the Art of Aeronautics to the fullest extent within its powers by stimulating interest therein.

In Particular.—To assist its members in carrying on experiments. To encourage inventors to experiment along aeronautic lines. To aid experimentors in the realization of their ideas by the provision of the most necessary facilities with which to carry on their work. To bring together, as far as possible, those working in the various fields of aeronautic endeavor in order that each individual may have the advice and co-operation of others.

And that these objects have largely been obtained is shown by the record of performances of the many machines which have been built, and some of them operated, at the Society's aviation grounds at Morris Park.

The Society is composed of enthusiastic workers, bound together with one great object, the advancement of aerial flight.

Among the members are scientists, professional men and mechanics, who devote their time to detail, and as a result of their co-operation some have evolved biplanes, monoplanes, dirigibles and aerial propellers that are of superior design and great efficiency, while others have studied engine problems and invented many devices of great utility as building aids.

Several model contests have been carried out under the management of a special committee, chosen by the members, which has led to the evolution of many new ideas in designs for aeroplanes, some of which show great promise and will certainly be heard of before the year is through.

This work has resulted in several instances in bringing together inventors and capitalists to their mutual interest.

Handsome silver cups and other prizes were awarded to the successful competitors, and the field of competition was made more interesting by introducing such features as marks for stability, originality and neatness of construction in addition to the usual ones for length of flight.

The cup presented by Leo Stevens for the first machine built by a member, carrying a passenger, was won by Dr. William Greene, with his biplane, with which he made many flights, taking two and even three passengers, and many members were able to have their first ride in the air.

Dr. Greene used a British-American 26 horse-power engine weighing 320 pounds. Subsequently he installed the Kimball motor, which was half the weight. The machine flew much better then, and on the Doctor's leaving for Middletown, O., to take up the manufacture of aeroplanes, the apparatus was bought by Mr. Kimball, and taken to Rahway, N. J., where experiments were continued with it in conjunction with F. E. Boland.

Nearly one-fourth of the members are patentees or actual builders of machines, and while many have put their ideas into practise at private workplaces, twenty-four full-sized heavier-than-air machines and one dirigible have been built at the Society's workshops since they were opened twelve months ago.

Five members, Leo Stevens, Dr. J. P. Thomas, Dr. Greene, Mr. Kimball and Mr. A. Meixner, made the New England ballooning record of 175 miles in 5 hours 50 minutes.

On June 21, 1910, an order was placed for a Curtiss aeroplane, and I believe this commission constituted the first purchase of an aeroplane ever made by an aeronautical society. It was the first commercial transaction of the sort ever made in America.

On June 26th Curtiss flew at Morris Park with the Society's machine, after which the machine was loaned by the Society to Mr. Curtiss for the purpose of practising long flights on Hempstead Plains, Mineola, L. I., preparatory to his entering the contests at Rheims. The fact gave the greatest pleasure also because at the time Mr. Curtiss had no other machine with which to practise.

While the machine was at Mineola two of the members of the Society were chosen to be taught to handle it. These were Alexander Williams and C. F. Willard, of whom quite a little has been heard recently. A notable event was the building of the Riggs-Rice dirigible, *The American Eagle*. John A. Riggs and Joel T. Rice joined the Society from Hot Springs, Ark., to build their machine at Morris Park. The new principle involved was the invention of Mr. Rice, and its idea was dependence entirely upon propellers for steering. Three propellers were used. One of them, placed at the nose of the car, could be worked in an arc horizontally, and was for steering left to right. The others, placed seven feet behind the front one, worked in a similar arc vertically to give up and down steering. All three were used for propulsion. The bag, 105 feet in length, which was made by A. Leo Stevens, had a capacity of 35,000 cubic feet, and was found to give a lift of over 1,600 pounds. The car was of steel tubing 100 feet long, 10 feet wide across the top, 2 feet at the bottom, and 5 feet high, and weighted with engine and gearing 1,040 pounds.

Many interesting lectures have been given at the weekly meetings. Hudson Maxim has several times honored the Society with such. Elmer A. Sperry described the uses of the new active form of gyroscope and its possible application to an aeroplane for giving equilibrium and exhibited a multiple instrument of his own design in action. Professor Herschel C. Parker spoke of the possibilities of the aeroplane in scientific mountaineering and exploration. R. B. Whitman lectured twice on the explosive engine, first telling of the development of ignition, and later describing the action and balance of four-cycle engines. Hugo C. Gibson also lectured on internal combustion engines. A. C. Triaca told the secrets of ballooning, and on a subsequent occasion F. W. White gave a remarkable display of photographs and moving pictures, which formed one of the completest lessons possible in ballooning. Octave Chanute, who, with the brothers Wright, is numbered among the Society's honorary members, honored the members at a meeting with remarks based on the results of his long experience, the value of which is best realized from the cognomen applied to O. Chanute by the French, "The Father of Aviation."

Aeronautics in New England

By Denys P. Myers

NEARLY a dozen aeronautic societies, at least a score of experimenters with heavier-than-air machines, negotiations for the purchase of aeroplanes by perhaps half-a-dozen persons, an aeronautic show in process of launching—such is the epitome of New England's present activities relative to aerial flight. No other portion of the country of equal area—the five New England States contain less than 65,000 square miles—can exhibit so much activity.

There are, however, good reasons for this. Unlike practically all the rest of the country, New England is not adapted to agriculture, and so its manufacturing population is naturally interested in mechanical advances. Many of its citizens are independent in fortune, and therefore have leisure to take up new sports. And New England is an educational center, so that technical aeronautic study receives a great deal of attention. While none of these elements is in any way exclusive to New England, their unusual combination there is certainly favorable to a practical interest in aeronautics.

The Aero Club of New England, the foster parent of the other organizations, is now in its fourth year, but it was projected as much as seven years ago. In Massachusetts there are aero clubs at Pittsfield, Springfield and Worcester and societies at Harvard University, the Massachusetts Institute of Technology and Amherst College. All of these are independent organizations, although the membership of the Aero Club of New England includes many affiliated with the others.

One of the few aeronautic schools in the country is at Boston, where the Y. M. C. A. is giving instruction to would-be sky pilots. The head of the school is H. Helm Clayton, who has acquired a reputation as a balloonist and who is in particular an expert on air currents. As a worker at Blue Hill Observatory, situated a few miles south of Boston, for ten years, he and the owning director of the observatory, Professor A. Lawrence Rotch, studied the phenomena of the upper air by means of kites with recording apparatus attached. The knowledge thus gained was first put to use in aeronautics when as a passenger in the balloon Pommern, October 17, 1907, his acquaintance with aerial habits enabled Oscar Erbsloeh to pilot the aerostat 872 miles to Asbury, N. J., winning the James Gordon Bennett Cup.

Much of New England's recent ballooning activity has centered around Mr. Clayton, who at the dinner of the Aero Club, on the night of January 24 last, was presented with the Boston Herald and Fitchburg trophies, both being awarded for a landing nearest to Boston Common. Mr. Clayton promptly put them up for further competition, the terms being that a balloonist start from Fitchburg and land nearest Boston Common. At the same time he asserted the possibility of a flight from Denver to the Atlantic coast.

The president of the Aero Club of New England is Charles J. Glidden, who is well known as a round-the-world autoist and the backer of the Glidden automobile tour. It has been his enthusiasm and financial aid that have made possible the great activity of the club. During 1909 eighty-seven flights, of which eighty-one were from Massachusetts and six from Vermont, were made, with an air mileage of 3,774 miles. The aeronauts numbered 137, of whom eighteen were women. The longest flight was on July 11th, when the balloon Massachusetts, carrying five persons, started from North Adams and landed at Topsham, Me., 180 miles away. Ten balloons were in service during the year, two belonging to the club. Mr. Glidden was on a good proportion of these flights, and is qualified as a pilot. In fact, he is president of the first Association of International Aeronautic Pilots, which he was instrumental in organizing at Boston last September.

The Aero Club's plans for this year include the putting into service of a third balloon of 80,000 cubic feet capacity, the projection of an aeronautic meet near Boston and the general expansion of aeronautic interest.

Much other work is being done along aeronautic lines in New England. Several Maine residents are taking keen interest in aeronautics, and New Hampshire, Vermont, Connecticut and Rhode Island people are keeping pace with them. The Boston papers are perhaps fuller than those in most parts of the country with accounts of New England experimenters with heavier-than-air machinery.

The whole country now knows the story of Wallace E. Tillinghast of Worcester, who claims to have made a 300-mile flight to New York and Boston in an aeroplane of his own construction, at a rate of 120 miles an hour, stopping his machinery in mid-air for forty minutes to have his two passenger mechanics repair some parts. An investigator of the Aero Club of New England found Mr. Tillinghast reticent as to his machine, and, proof of his assertion thus being lacking, discredited the story; but Mr. Tillinghast, who, it has been found, has applied for aeroplane patents, bears an excellent reputation as a trustworthy citizen in Worcester, sticks to his story, and has promised to produce the machine in his own time. If half of his claims are substantiated, he has everything else in the aeroplane line surpassed.

Beginning late this month an aeronautic exhibition is to be given in Boston. At it every conceivable type of balloon, dirigible aerostat and practical aeroplane, mono- and bi-, will be shown. Besides, the usual quota of freak machines will be given space. The exhibition will bring to light several new freaks and many which already have become known. One of the most ambitious of these latter is a double-decked proposition capable of carrying twenty persons, according to the claims of its inventor, who points out that no one has yet been able to tell him why it cannot fly. He himself does not claim that it ever has. Another is a collapsible monoplane which, according to theory, will fold its wings up and serve as an automobile at the desire of its inventors.

The popularizing of aeronautics in New England began in November at the "1915" Boston Exposition, where the Curtiss machine used at Rheims and models of all other aeroplanes and many balloons were shown. Educational efforts have been going on steadily, chiefly by means of lectures. Charles J. Glidden, Albert A. Merrill of the Boston Y. M. C. A. aviation school, and Professor A. Lawrence Rotch of the Blue Hill Observatory have been the most indefatigable lecturers, but college professors and others have also appeared on the platform. The Harvard Aeronautical Society is perhaps most active in this work, although Yale, Amherst, Technology and Dartmouth are not far behind the Crimson. The Harvard Society was organized in November with nearly 300 members. Since then it has given an exhibition of models and photographs, and is at present holding weekly meetings, many of which are public, and which consist usually of a lecture upon some scientific problem in connection with aircraft.

Aside from the Tillinghast machine, which, if the claims made for it are substantiated, is easily the best heavier-than-air craft yet constructed, little has been done in New England that can be called unique. Yet the widespread interest in aeronautics is producing a comprehension of the problems involved in flight that will probably soon yield tangible results in genuine advances. The traditions of Yankee inventiveness will certainly be disproved otherwise.

Aero Club of Baltimore

By James T. O'Neill, Secretary

WHEN Glenn H. Curtiss was declared the champion aviator at the international aviation meet at Rheims, France, last year, he brought to the United States not only the championship trophy, but also the privilege of holding the international meet for 1910, and to this the people of the entire world are now looking forward with interest.

According to the rules of the Aviation Congress, the meet in America is to be held on a course selected by the Aero Club of America and controlled by organized local clubs affiliated with that organization. And this course, it is almost definitely settled, will be at College Park, Md., approximately half way between the great cities of Baltimore and Washington and convenient to Philadelphia, New York, Boston and scores of other cities. Only the formal announcement is required from the Aero Club of America and the question of rivalry between many aspirants will be settled beyond all question.

Practically assured that College Park will be the course, Baltimore and Washington have raised a joint fund of $100,000, contributed equally by the two cities, as a guarantee for substantial prizes for the competitors and for the proper conduct of the meet, and another $100,000 will be raised, should necessity arise.

The movement for College Park originated in Baltimore, where a meeting of representative citizens was held at the City Hall, with Mayor J.

Barry Mahool presiding. An offer of a $500 prize by the Baltimore *Sun* was quickly followed by similar offers, most of which have since been increased to $1,000, and the campaign for funds was started by the Aero Club of Baltimore, of which Colonel Jerome H. Joyce is President. An invitation to Washington to join the movement was immediately accepted, and the application for the meet was presented last summer at a dinner given by the Aero Club to Mr. Curtiss, at which the Baltimore-Washington delegation were also guests of honor.

Although at that time the national organization was unable to give a definite reply to the twin aspirants, the heartiest encouragement was extended.

About twelve miles from Washington and twenty-eight miles from Baltimore, College Park is easy of access by steam roads and trolley lines, with capital roads for automobile and carriage travel. Beyond this, however, it is described by aviators as ideally situated for aviation, while Professor Willis L. Moore, Chief of the United States Bureau, has prepared statistics showing that the climatic conditions cannot be surpassed. The average velocity of the wind is about eight miles an hour, the field is level and of ample proportions, and the ground is familiar to many leading aviators, who have sailed their aeroplanes in that section.

In anticipation of the meet being held at College Park, the promoters in Baltimore and Washington have been assured of the support of the United States Government, which will do all in its power to contribute to the success of the affair. Troops will be furnished to police the ground and protect both aviators and spectators, and to guard the roads and guide the traffic. College Park is the government aviation field, and the Federal authorities are prepared to meet all the requirements of even such a monster meet.

For foreigners College Park offers especial attractions, being accessible through the port of Baltimore from all parts of the world. The monster steam-ships now plying between Baltimore and the leading ports of Europe will be reinforced by a great fleet of similar vessels, permitting the shipment of aeroplanes and paraphernalia and the transportation of passengers practically to the very gates of the field.

Visitors from all parts of the United States will also be transported to the two cities with a maximum speed and a minimum of discomfort by the great railroads running into Baltimore and Washington from all points of the compass.

The Pennsylvania Railroad, the Baltimore & Ohio, The Southern, the Atlantic Coast Line, the Chesapeake & Ohio, the Louisville & Nashville, Queen & Crescent, and the Western Maryland are a few of the railroads entering the two cities, while lines of steamers connect Baltimore with the great coast cities of the Atlantic and the Gulf of Mexico.

Millions of persons reside within an area of a few hundred miles, and a large proportion of this immense population will undoubtedly attend the meet.

Harvard Aeronautical Society

By James V. Martin, Director

THE Harvard Aeronautical Society, of Cambridge, Mass., is perhaps the largest and most active Society of this kind in the world. It was organized November 11, 1909, by James V. Martin, and has already three hundred members enrolled. A course of ten lectures on the subject of aeronautics was arranged for the winter, and they have attracted a great deal of attention and enthusiasm among the aeronautically inclined in Cambridge. One of these lectures was illustrated and showed the various types of aeroplanes in motion.

A library has been established with seventy-two books relating to aerial navigation and its various problems. Working models of the Wright and Bleriot machines have been secured, and a full sized aeroplane is now in the course of construction which will represent the Society in various contests next summer, and various steps are being taken to have a flight exhibit near Boston during the month of May. Professor A. Lawrence Rotch, founder of the Blue Hill Observatory, is President and Professors W. W. Pickering, F. L. Kennedy and L. S. Marks are on the Advisory Board.

The aeroplane now being constructed for the Harvard Aeronautical Society, and which will represent the Society in various contests in the future has been named the "Harvard I," and will excel in workmanship and design anything that has yet been attempted. The weight, with engine and oil, 275 pounds; 250 pounds thrust, excess of strength five times that required; speed 42 miles; excellent sustaining curve, 290 square feet of surface.

Other universities are following the Harvard example, so in the near future the public may expect to hear of intercollegiate flight contests which will doubtless prove keen rivals of all other athletic sports.

COL. JEROME H. JOYCE, PRESIDENT AERO CLUB OF BALTIMORE

The Southern Aero Club

By Dr. L. L. Lavadan, Secretary

THE Southern Aero Club, of New Orleans, La., is the first aero club organized in the South to practically develop the art of aerial science.

The officers are:

Dr. Thomas W. Carey, Jr.........President
F. Freije.......................Vice-President
Dr. L. L. Lavadan.....Secretary-Treasurer

DR. THOMAS W. CAREY, JR., PRESIDENT SOUTHERN AERO CLUB

The objects and purposes of the Southern Aero Club are to promote interest in and develop the aeroplane in every particular for the professional and the amateur aeronaut; to encourage the study of aerial science, and to hold exhibitions and contests of apparatus designed for the purpose of aerial locomotion.

The organizing of the Southern Aero Club is the initial step in the direct line to bring about conditions that will produce flying apparatus in the South.

The Club will also have all the facilities for members to build and construct their own planes, and develop their own ideas into practical fliers.

The Club will have workshops where members may make their initial trials, sheds in which the members may house their machines rent free, and grounds where members may learn the art of flying. The Club will have weekly meetings, lectures, library, and an experimental fund; and in the near future a local aviation meet that will be in the nature of a flying contest, and not merely an exhibition.

The Southern Aero Club are now constructing a monoplane on entirely new lines, and hope to produce a flyer that will do credit to their efforts.

The South will, from actual climatic conditions, be the Mecca of flying in America.

Club Notes

CORTLANDT FIELD BISHOP, President of the Aero Club of America, has notified the members that a special meeting of the organization will be held next month.

The purpose of this meeting is to consider and act upon the report of a special committee which was appointed at the meeting of the club on November 1st last, with instructions to make recommendations upon the subject of amending the club's certificate of incorporation, constitution and by-laws.

The Committee, in its report filed with the president, urges that the name of the present corporation, "Aero Club of America," be changed to "Aero Corporation, Limited," and that an incorporated club be formed under the membership corporation law of this State with the name "Aero Club of America."

The shares of stock of the corporation are to be assigned and transferred to the club as its property, and the corporation stock is to be voted pursuant to the direction of the board of governors of the club, who shall select the directors for the corporation.

All the members of the present Aero Club who have paid their dues for the year ending November 1st next are to have the privilege of becoming members of the new club without the payment of initiation fees and annual dues for the current year. Any member not in favor of this plan is to have the privilege of withdrawing from membership in the existing club, and in that event his initiation fee and proportion of dues paid covering the unexpired portion of the year are to be returned to him.

The special committee, whose report will be acted on at the meeting next month, consisted of W. W. Miller, Chairman, Cortlandt Field Bishop, Philip T. Dodge, W. W. Niles and Dave H. Morris, Secretary.

The Michigan Aero Club has been formally launched at Detroit. Among the members of the committee are Messrs. R. D. Chapin, H. B. Joy, Russel A. Alger and Frederick Wadsworth.

Mr. Glenn Curtiss was recently elected honorary president of the Oakland Aero Club, which has a membership of one hundred and seventy-five.

The South Side Aero Club, St. Louis, is building a balloon, which Captain John Berry is to pilot. The club has been notified that the Laclede Gas Co. will reduce the price of gas owing to numerous ascensions planned for next summer.

The first Women's Aviation Club in the United States was organized recently at Los Angeles. The officers of the Women's Aviation Club are: Mrs. John Reavis, President; Mrs. Dick Ferris, First Vice-President; Mrs. Sydney Lee Grover, Second Vice-President; Miss Jessie M. Flint, Secretary; Mrs. G. H. McGinnis, Treasurer. Already the membership includes a number of enthusiastic women of Southern California. It is the intention of the members to systematically take up the study of the aircraft subject.

The Aero Club of Buffalo will hold a model aeroplane contest on March 1st. The winner will receive a silver cup, donated by John M. Satterfield, president of the club. The club has recently elected forty-six members. Mr. James How is chairman of the Model Contest.

Bakersfield, Cal., has an active aero club, the members of which are small boys, the oldest member being only fourteen years of age.

The Aero Club of America has leased from the Garden City Co., a large real estate concern, an acre of ground near Garden City, L. I., at the edge of the Hempstead Plains, with the privilege of flying over all the other property controlled by the Garden City Co.

In the city of Paterson, N. J., there has been formed an aero club, with a membership of over sixty men, who are resolved to have an aerial meet to last two weeks, and to be held during the months of May and June this year. Prices aggregating about a hundred thousand dollars will be offered by this club to the great aviators of the world.

It is believed by those heading the movement in Paterson that a full membership of a thousand persons will be easy to secure.

The President is V. L. Ochoa; its Secretary, William S. Martin, and its Treasurer, Thomas W. McAndrews.

PERSONAL NOTES

By Ada Gibson

A GLIDE of 250 yards in their motorless biplane was recently accomplished by A. D. Fowler and John Fowler, brothers, at Springfield, Mo.

Professor F. W. Smith, of the N. N. T. S., is building an aeroplane at Aberdeen, S. D., similar to the Curtiss machine.

By introducing small single planes within large planes a man named McCarthy, of San Leandro, claims to secure a perfect equilibrium for his aeroplane

Mr. W. S. Globe, of Fresno, Cal., has built a flying machine which has attracted considerable attention on the Pacific Coast.

A patent on an "Automatic Air-Cushion Balance" for aeroplanes has been applied for at Washington by Mrs. Ida M. Von Claussen.

Mr. Victor W. Page, M.E., of Providence, R. I., is the inventor of the aeroplane, and Mr. Oliver Light of the same city is the inventor of the motor of the machine, to be manufactured by the L. A M. Motor Co.

Miss Lillian Todd, a lady inventor of New York, hopes to have her new aeroplane in shape to fly some time in May.

One of the most persistent inventors along aeronautic lines in this country is Professor H. La V. Twining, member of the Aero Club of California. His latest experiment is on the ornithopter type.

Mr. Merrifield Martling, of Kansas, is working secretly on an airship which he says will be different from anything yet produced.

A new record for the Wright biplane type of model was made by Morel Sage of New York at the Y. M. C. A. Model Contest, the distance made being 95 feet 4 inches.

A. P. Warner, of Beloit, Wis., has invented an aerometer for registering the speed of aeroplanes. He is also working on a device for checking air skids.

J. F. Scott, of Lawrenceburg, Ind., is the inventor of a triplane. It is said he is negotiating with the United States Government for the sale of it.

A. L. Pfitzner, of Hammondsport, N. Y., is meeting with considerable success in experimenting with a new balancing device which he is utilizing in connection with the monoplane which he recently constructed.

Mr. J. Loose is the inventor of a new biplane the wings of which are curved similar to those of a bird. He is practising with it at San Francisco, Cal.

An aeroplane that can be packed in specially made trunks and transported as personal luggage is the latest invention of Howard W. Gill, Baltimore.

Mr. Emile Berliner, Rexford M. Smith and W. H. Beck were exhibitors of flying machines of their own invention at the Washington Automobile Show.

O. J. Pruitt, of St. Joseph, Miss., has completed the construction work of a monoplane and is about to install the engine.

Frank Steffan, of Los Angeles, Cal., claims to have originated a device that will prevent a flying machine from taking a quick drop when the motor power fails. His new invention he calls a "Kitaplane."

Mr. Sydney B. Bowman, of both bicycle and automobile fame, is presenting a handsome cup for the best constructed aeroplane model during the season of 1910. Any club within the jurisdiction of New York has the privilege of competing at the regular contests held by clubs and colleges of New York.

Mr. Wilcox, President of the Columbia University Aero Club, is building some extremely fine propellers at Leo Stevens' workshop. Great results are expected from the many specially designed models.

Hugo C. Gibson, the well-known New York gas engine authority, intends to make his debut as an aeronaut with a Romme monoplane, installed with a Renna-Gibson motor, of which he is the inventor. Mr. Gibson hopes to fly from New York to Albany some time during the spring.

A Bleriot machine has arrived at Providence, R. I., for Leo Samuels. John Shepard, Jr., of Providence, R. I., has ordered a Wright aeroplane, and John W. Kaulman, of Columbus, O., is another purchaser of a flying machine.

Leo Stevens, the celebrated balloon manufacturer, has offered a cup for the longest flight made by a model aeroplane during the season 1910. Designs for Mr. Stevens' cup are being prepared by Diejes & Clust of New York.

The first aeronautic alumni association to be formed in this country has been organized by the graduates of the aeronautic class, established last October by the West Side Y. M. C. A. The officers of the Alumni are Dr. Rex. C. Worthwood, President, and Francis C. Willson, Secretary and Treasurer.

The Boston Aero Club have placed an order with Leo Stevens for a new balloon of 38,000 cubic feet, which is to be delivered by March the first.

The Harvard University Aeronautical Society, of which J. V. Martin is Director, is about to build a full-sized, two passenger biplane. Plans for the machine are completed, and the manufacturing of the parts and assembling of same will be in charge of the undergraduates of the engineering and scientific department of the university.

At a conference of the Aero Club, held at St. Louis recently, a resolution was passed to petition Congress to determine the value of aerial craft in warfare. A committee from the aero clubs is to call on President Taft to ask him to undertake steps to insure the development of aerial craft. The conference, which was presided over by Mr. Cortlandt F. Bishop, President of the Aero Club of America, represented aero clubs from thirteen cities and States.

St. Louis is to have a company for the manufacture of aeroplanes, to be known as the Aero Motion Co. of America. Among the incorporators are H. Brussel, M. Sequin, and J. P. Walsh. The nominal capitalization is $2,000.

In a speech at a recent dinner in New York Philander C. Knox, Secretary of State, prophesied that airships would bring nations much closer together, and enumerated them among the first agencies toward international unity.

Interest in aviation was put to a test recently in Carnegie Hall, and by no means found wanting, when Burton Holmes, in his talk on "Sicily," featured the aviator at Rheims, showing the pilots of the air steering their machines over the heads of the spectators.

A company is being formed to further the use of aeroplanes in the United States, especially Southern California. The company contemplates purchasing two Farman machines and demonstrating them in the small towns of the West. Among the men who are to affiliate themselves with the company are H. L. Cornish, John Nightingale, G. E. Nagle, George Cline, Edward Helms, Dr. N. . . Hirtz, Al Levy and Dick Ferris.

It is reported that Mr. C. W. Parker, the millionaire showman of Abilene, Kansas, has purchased a Farman biplane for $7,500.

Mr. Chas. S. Clark, General Manager of the Second Annual Motor Show of Milwaukee, Wis., has arranged to add an aeroplane exhibit to the show which takes place on February 22d to February 27th.

Two aeroplanes will be exhibited at the Portland, Ore., Automobile Show. A Curtiss machine, just purchased by Mr. E. Henry Wemme, who has the honor of being the first person in Portland to own an aeroplane. The other machine to be exhibited is Mr. I. C. Burkhart's biplane, which he has been building in accordance with his own ideas.

All aviators and balloonists who took part in the Los Angeles meet were awarded handsome bronze medals, bearing their names, date and event. The presentations were made by D. A. Harfurger, Chairman of the Aviation Committee.

Mr. W. Morrell Sage, designer and engineer, has joined Leo Stevens in connection with the construction of aeroplanes; so it is expected that something really interesting will be on the market during the season 1910.

Justice of the Peace Morris H. Kammelhor, who lives in the West Park section of Cedar Grove, N. J., has announced to the public that he will attempt to stop all flying machines from passing over his home.

Recently the Justice heard that Oscar Pfannebecker, a young aviator of Paterson, had completed a monoplane which he intended to try in the vicinity of the Kammelhor home. The Justice donned his fur overcoat and visited a sign-painter in Paterson, who prepared a sign ten feet long and five wide, which reads:

> NOTICE!
> All Aviators Are Hereby Warned Not to Fly Their Machines Over This House Under Penalty of Imprisonment.
> MORRIS KAMMELHOR.

The sign is fastened to the flagstaff of the Squire's house.

He intends to run a string of lanterns around the sign so that it can be seen at night.

Squire Kammelhor insists that he owns to the heavens above his premises and to the center of the earth the other way.

Coming Aircraft Events

THE Internationale Aeronautique Federation recently awarded the dates for the aviation meetings to be held throughout the world this year. More than $500,000 in prize money will be offered in 1910 for events held under the auspices of the federation.

Fourteen meets are scheduled between April 10th and November 2d, for which the total sum of $416,000 has already been promised. This does not include the meets at Berlin, St. Petersburg, Milan, in England and in the United States.

According to the rules of the Internationale Aeronautique Federation, no city may be granted exclusive dates for an aviation meet unless at least $40,000 in prize money is offered. No amount so far has been guaranteed for the American and two English meets, but it is certain that more than $40,000 will be offered at each of these, as exclusive dates have been granted the clubs behind the meets. The Berlin, St. Petersburg and Milan dates are not exclusive, therefore it is probable that the amount of money that will be offered in these three cities will not reach the limit.

The longest dates awarded are those secured by the Aero Club of America. This meeting will close the series of official flights, the week being devoted to competition for the Gordon-Bennett Cup. The American dates are from October 18th to November 2d. Several cities have bid for the aviation meets awarded to the United States, but no selection will be made until all the bids are in.

AMERICAN EVENTS

October 18th to 25th...International Balloon Race.
Place not yet decided upon.

October 25th to November 2d..International Aviation meet
Place not yet decided upon.

FOREIGN EVENTS

March 11th to 19th	Olympia, England.
April 3d to 10th	Cannes.
April 10th to 25th	Nice; $46,000.
May 10th to 16th	Berlin.
May 14th to 22d	Lyons.
May 20th to 30th	Verona; $42,000.
June 5th to 12th	Vichy.
June 5th to 15th	Budapest; $120,000.
June 18th to 24th	St. Petersburg.
June 26th to July 10th	Rheims; $40,000.
July 11th to 17th	England.
July 14th to 24th	Rheims to Brussels; cross-country event.
July 24th to August 10th	Belgium; $40,000.
August 6th to 13th	England.
August 25th to September 4th	Deauville; $48,000.
September 8th to 18th	Bordeaux; $40,000.
September 24th to October 3d	Milan.

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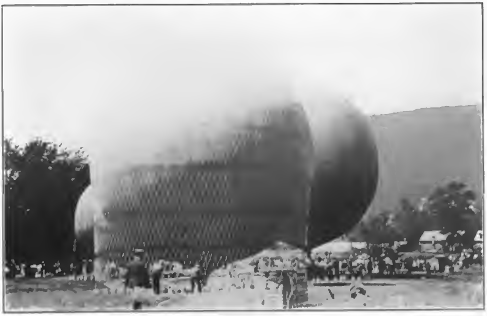

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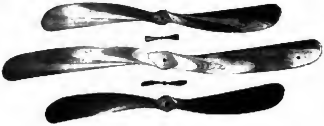

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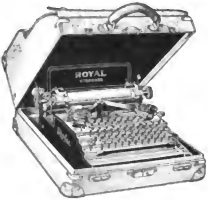

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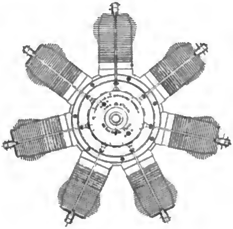

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SUMMARY OF HUMAN FLIGHT

By Mrs. J. Herbert Sinclair

Continued from March AIRCRAFT

THE growth of ballooning during its early history having spread to almost every quarter of the globe, the inventive genius of man set to work to devise ways to direct or at least deviate its course, instead of permitting it to be entirely at the mercy of the winds, and, like all other strides men have taken during the past towards progress, met with innumerable failures and set-backs—so many in fact, that it is remarkable that the tenacity of endeavor along this line was not abandoned as being altogether fruitless.

And like in all laborious steps taken by man in his eternal march onward, ridicule and satire were the rewards of his efforts in this direction.

This public derision was naturally increased by the many senseless ideas and suggestions, given out by that class of impractical inventors who never take the trouble to investigate the efforts of their predecessors, to avoid perpetuating their mistakes with the really reliable searchers.

It might here be said that they are as numerous now as they were in the eighteenth century; in fact at no time were there more weird and impossible suggestions being made in connection with aerostatics and aerodynamics, than at the present time.

It is the intention of this article, however, to mention the names of those who had either a direct, or, in some instances, an indirect connection with the general advancement of actual flight.

It must be acknowledged that the progress made in aerostatics during the past 120 years was slow and tedious, and that only during the last few years was the progress sufficient to warrant the general public taking more than a passing interest in it.

The first ideas advanced to guide a balloon were taken from water-craft, sails, oars and rudders being utilized for the purpose. This did not accomplish what was expected, owing to the fact that the sails and the balloon being immersed in the same fluid there was no chance of leverage, and the sails fell limp and useless, only acting as an extra weight for the balloon to carry.

Guyot constructed the first elongated balloon. Its long axis was horizontal and its shape that of an egg; the broader end was supposed to face the wind and sails were counted on for propulsion, a radical mistake in principle, as explained.

The air offers an immense resistance to the proper motion of a balloon and nothing short of propellers driven at high speed have enabled one to overcome it, even in calm weather.

From the system attempting propulsion by oars evolved that of paddle wheels mounted upon a shaft and projecting over the sides of the car.

While this move was a slight improvement, still experimentation along this line but served to demonstrate the unwieldy shape of the spherical, or nearly spherical balloon, and resulted in a gradual increase in the length and decrease in the diameter of the gas-bag of dirigibles.

General Meusnier played a prominent part in the progress of aerostatics by introducing the use of air-bags inside of the balloon. Meusnier was a thorough scientist who carefully studied all works relating to the air and the shapes of bodies offering the least resistance to it. He discovered that an elliptical shape was the most suitable, and in order to attain the least possible resistance, he adopted a boat-shaped car to run horizontally beneath the gas-bag. He was the first to advocate the necessity of an absolutely rigid connection between the car and the gas-bag of a dirigible balloon. But while his plans for the construction of a dirigible were very carefully arranged they were never carried into effect, owing to the great cost required to do so. He was killed in 1793 at Mayence, fighting against the Prussians, and from that time until the middle of the Nineteenth Century little or nothing was done to advance the art.

In 1851 Giffard succeeded in constructing a small steam engine of 5 H.P., which weighed but 100 pounds, and then set to work immediately to test its usefulness in connection with a balloon. He therefore constructed a cigar-shaped bag 144 feet long and 40 feet diameter at the centre, and having a capacity of 88,000 cubic feet. A heavy pole 66 feet long was attached to the net covering the envelope by means of ropes, at the end of which was placed a triangular sail-like rudder. The car containing the motor and propellers was carried 20 feet below the pole. The three-bladed propeller was 11 feet in diameter and driven at the rate of 110 revolutions per minute. The total weight of the airship, including a 350-pound boiler and one passenger, was 1½ tons, and had a carrying capacity of one-fourth of a ton of coal and water. With this and a subsequent balloon (built longer and narrower) Giffard did much valuable experimental work, but after designing a mammoth dirigible of 1,750,000 cubic feet, to which was to be fitted two engines and which would have cost $250,000 to construct, he became blind and died in 1882.

In 1872 Dupuy de Lôme built for the French Government a dirigible with a cigar-shaped body 118 feet long, 49 feet diameter at the centre, and with a capacity of 122,000 cubic feet. It carried 14 men and attained a speed of 9 feet per second.

In 1873 Paul Haenlein built a dirigible in Germany, which attained a speed of 15 feet per second. It was 164 feet long, 30 feet in diameter, and had a capacity of 85,000 cubic feet. The car was located close to the body, and a 6 horse-power Lenoir gas engine with four horizontal cylinders was used. The gas for the engine was taken from the balloon as needed, and its loss overcome by filling out the air-bags. It consumed 250 cubic feet of gas per hour. The envelope was lined on the inside with a thick rubber coating and a thinner one on the outside, thus making it airtight. Coal gas was used and trials were usually made close to the ground and for short distances only. Insufficient funds to pay the cost of experimentation made it necessary to discontinue the trials and for ten years afterwards no progress at all was made in the construction of airships.

To be continued in May AIRCRAFT

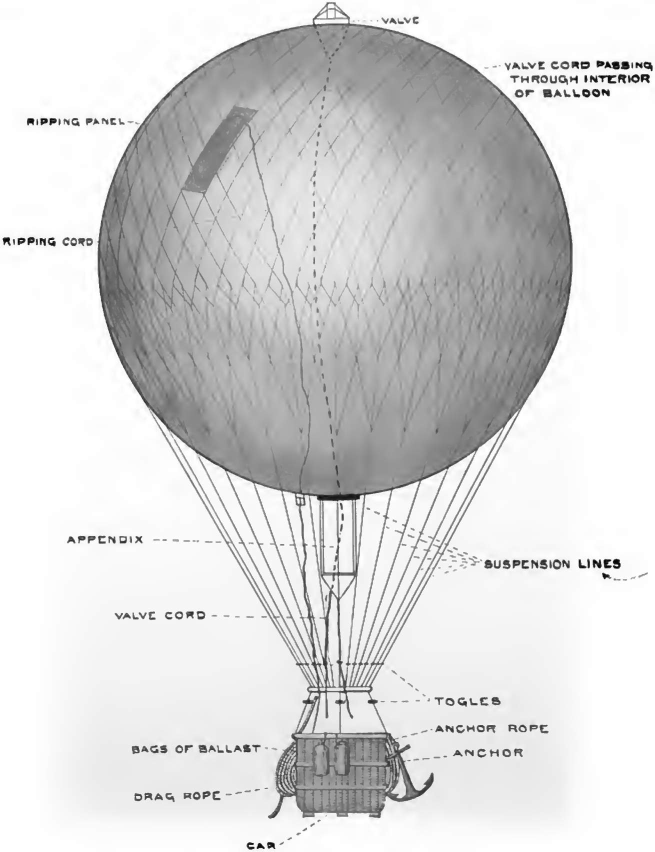


FIGURE 1

DESCRIPTIVE DIAGRAM SHOWING THE CONSTRUCTION OF A SPHERICAL BALLOON

Drawing by the Requa-Gibson Co.

HOW STEVENS BUILDS A BALLOON

By Ada Gibson

IT it not too much to say that balloon-making has now gotten to be a fine art among the leading manufacturers. Prominent among these is A. Leo Stevens, who is as celebrated a manufacturer of balloons as he is a pilot of them.

Elsewhere in this number of AIRCRAFT occurs a biographical sketch of Stevens's aeronautic career and the following information concerning the manufacture of balloons in his New York and Hoboken, N. J., shops affords an exact explanation of how a modern balloon is made, and as such may come as a revelation to many on the care and ingenuity displayed in this very modern industry.

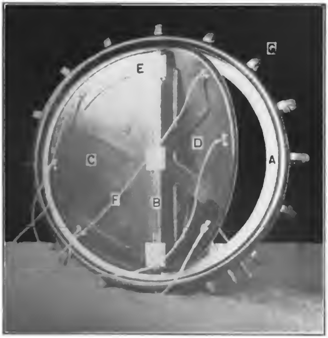


FIGURE 2

A. VALVE SEAT
B. HINGE POST
C. HALF VALVE CLOSED
D. HALF VALVE OPEN
E. HINGE
F. OPERATIVE CORDS
G. STRAPS FOR NETTING

The fabric with which Mr. Stevens makes his balloons is a mixture of cotton and linen. This cloth is woven out of specially long thick fibers which gives it greater strength and durability than if made from short fibers, the linen also adding to the strength.

Silk is now very seldom used, as it has recently been discovered that it is rather dangerous, on account of the static electricity which is found in the air. Another material sometimes used is the imported Continental cloth. This is made up of a number of layers of cloth vulcanized together and rubbered outside. It may consist of one or more layers of material, the number varying with the strength required for the purpose to which it is to be put.

The first process that the unfinished cloth is put through after its arrival at the factory, is that of a thorough examination for flaws. This operation shows the amount of time which is of necessity expended on every small part used in the construction of a balloon, as just the minutest defect in the weaving would make it pervious and render the whole envelope useless. The examination is made by drawing the material over rollers which are fixed close to a window in the same manner as an ordinary window shade, the room being dark, except for what light comes through the material and the thin spots or flaws being detected by the extra light coming through them. After it has gone through this examination the next process is to pass it through a set of rollers which are attached to one side of a vat, or tank, containing size. It is put through these rollers, passed through the size in the tank and is taken up by, and wound around a roller fixed on the opposite side of the tank. By this means it is impossible to get any crinkles or creases in the material, as it is kept perfectly straight throughout the whole operation. This is another case, where, if the process were defective the material would become useless, as it would be impossible to produce a perfectly shaped balloon without perfectly flat material. After the material is quite dry, it is laid out in very long lengths on the floor preparatory to being cut out.

The envelope of a balloon is built up of a number of circular sections of different sizes sewn together, each circle being made up of a number of wedge-shaped pieces, according to the size of the circle necessary to form the shape required, and as there are from 12,000 to 25,000 of these pieces in one balloon, it requires great care and ingenuity in laying out the templets or patterns by which the material is cut. To entirely prevent the possibility of an error each piece in each circle is numbered and

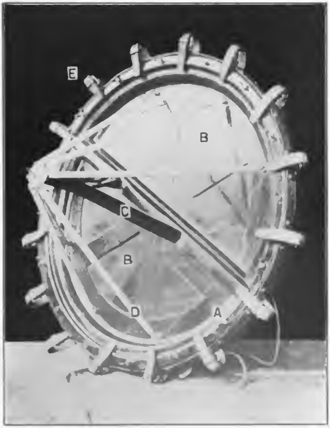


FIGURE 3

A. CLAMPING RING
B. VALVE DOORS
C. SPRING ANCHORAGE
D. SPRING
E. STRAPS FOR NETTING

has to be joined to its corresponding number, and in the same manner each circle is numbered and has to be joined to its corresponding circle, thereby developing the shape desired. The numbering of the pieces and circles also facilitates the building up of the balloon, as it renders it possible to have a number of hands working on all parts at once, without the slightest chance of a mistake occurring by getting the pieces mixed and wrongly placed. The sewing together is done by a special machine which is known as a double stitcher and which is a very interesting piece of machinery, inasmuch as it does two rows of stitching and turns in the edges all at the same time. The machine is driven by an electric motor and the parts to be stitched are fed into it by girls, as shown in figure 4. After the circles are all made and stitched together the next operation is most important, that of finishing off, which consists in the setting out and working with heavy silk, of a number of holes around the top of the envelope through which the bolts fitted in the valve ring have to pass, and by so doing attaching the envelope to the valve. It is imperative that the holes should exactly correspond in position with that of the bolts, because should they be the slightest out of position, it would cause a dragging of the envelope which would spoil its shape entirely.

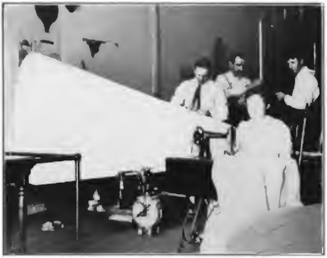


FIGURE 4

REËNFORCING AND STITCHING SEAMS IN ENVELOPE

Balloons have what is called a ripping panel, which is a panel let in the side of the envelope. It is about 25 feet long and 15 inches wide. It is made by first cutting a piece out of the envelope, stitching it round and reenforcing it with extra material. Then a little above the top of the opening, a piece of wood is securely fixed; this is to prevent any tearing away of the balloon proper when ripping the panel out. The panel itself consists of a piece of fabric slightly larger than the piece previously cut out of the balloon. This also has a piece of wood fixed to the top end, to which the ripping cord, with which the pilot performs the operation of ripping, is attached. The cord is carried down into the car, the end is rolled up and put in a red pocket made especially to accommodate it. Tape is usually used for the purpose instead of cord, to enable the pilot to distinguish it from the valve cord when it is dark, and it is red to denote danger to passengers unfamiliar with its use. After the panel is stitched over the aperture, the stick in the loose flap at the upper end is lightly tied to the corresponding stick in the envelope, so as to hold it in position, but allow it to be pulled away when required. When finished, this panel gives the envelope the appearance of having been patched, as shown in figure 1. This ripping panel is used when making a descent. The pilot of the balloon first makes sure he is going to land in the right place, then just before the car touches the ground he pulls the ripping cord and rips the panel out. This allows the gas to escape from the envelope with such rapidity that it is entirely empty in thirty seconds. The balloon is carried just a short way out during the thirty seconds that the gas is escaping and lands to one side of the car at the limit of the suspension lines. This does away with any danger of the car being dragged along the ground and also makes it possible to make a hasty landing.

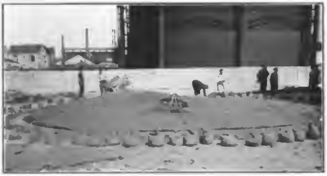
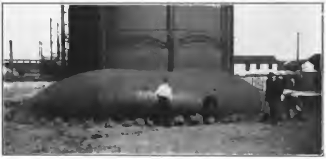


FIGURE 5

ARRANGING BALLOON PREPARATORY TO INFLATING



BALLOON PARTIALLY INFLATED

After the envelope is constructed it is varnished. This work is done at the Hoboken factory. Here the balloon is spread out on tables and varnished by eight or ten men at the same time, as it is necessary that it be gone over practically all at once on account of the tendency of the varnish to become tacky, and caus-

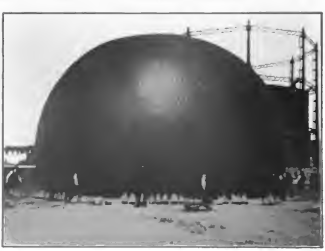


FIGURE 6

READJUSTING SAND-BAGS AS BALLOON EXPANDS ing trouble by sticking the envelope together wherever it should happen to touch. After it has been varnished all over it is kept inflated with air, which is continually pumped into it for three days, then deflated, and the same process of varnishing and inflating is repeated five times. While still inflated for the fifth time a coat of varnish is put on the inside; this is done to render it absolutely impervious, the air tending to drive the varnish through the fabric to the outside and fill up the pores.

After the last coat of varnish is put on, all seams are pencilled, or, in other words, varnished again with a small brush; it is then allowed to stand inflated for three days to make quite sure that there is no leak. After it has been proved tight, the whole envelope is rubbed down with French chalk and is ready for use.

SHOWING POSITION OF SAND-BAGS AND NET AFTER BALLOON IS INFLATED

At the very top of the balloon is a large valve, which is one of the most important components of a balloon (see figure 3), for, used in conjunction with the ballast, it is the pilot's only means of control. The intention being that no gas shall escape from the balloon, except when intended by the pilot, the valve is made so as to remain closed by the pressure of the upward tendency of the gas against it, and in addition, springs are used, acting in the same direction, so that, in order to open the valve, it is necessary to exert considerable force This valve is really a double valve, and each semi-circular half is arranged as a swinging door, both being hinged on a common post, which is set as the diameter of a circle, so that the valve acts much like a butterfly's wings, the valve being open when the wings are lying close together (see figure 2). A cord is attached to each door or wing of the valve and taken down to the car, rolled up and placed in a pocket fixed on the inside of the car for that purpose. The circle, or rim referred to forms the frame of the whole valve and consists of two rings with bolts and fly-nuts for fastening them together. In assembling the valve to the envelope, the nuts and one ring are removed, the buttonholes in the envelope accommodating the bolts, and the loose ring is placed on and tightened down by the nuts, so as to make a gas-tight joint between the envelope and the ring.

The netting which encases the balloon is also made on the premises. It is made of cord of small dimension, no larger than ordinary wrapping cord, which Mr. Stevens imports from Italy. The netting is made on a frame with an iron needle. First of all a strong rope ring is woven, and from this starts all the cords used in the netting. The cords are placed over pegs fixed in the frame, then wound over the netting block, which is just an ordinary piece of wood cut to the size of the mesh required in any particular part of the net, and with the needle it is knit into an ordinary sailor, or reef knot. This kind of knot is used, because the greater weight it is made to bear, the tighter it becomes. The netting is started with from ninety to three hundred cords, according to the size of net required to cover the balloon, and is worked down to eighteen cords, where it joins the suspension lines. When the net is finished there is an equal strain on every thread, and it fits the envelope perfectly tight. The cords are attached to the suspension lines through small wooden eyes, grooved around the outer edge, in which grooves the cords run, thus allowing the balloon to sway about as carried by the wind, while the car remains perfectly level. These eyes are a great improvement on the old-fashioned, cumbersome wooden pulleys which were used in days gone by.

Mr. Stevens has introduced a special system in the knitting of his nets which facilitates keeping the balloon in its correct shape, as the gas expands it during the process of inflating. To do this, it is necessary that the sand-bags which hold the balloon down (see figure 6), be attached to the netting in the same circle all around, and as there are hundreds of circles and meshes, it would be quite easy to miscount them. To do away with this difficulty, Mr. Stevens conceived the idea of using alternately, colored and natural cord, which makes it much easier to trace the mesh required, and rather adds than otherwise to the appearance of the balloon.

When the rope ring at the top of the netting has been fixed to the valve by means of the straps provided on the valve for the purpose, the balloon becomes a whole (as the envelope has already been attached to the valve), and is now ready to be inflated for use.

Before inflating the balloon, the concentrating ring, which fits around the top of the appendix is slipped on, and the balloon is carefully spread out, with the valve laying exactly over the entrance to the envelope at the top of the appendix (see figure 5). It is then ready to be filled with hydrogen gas, which is made by the action of sulphuric acid on iron, water being added for diluting purposes.

Hydrogen gas is generated in vats or tanks, about six feet in height and six feet in diameter. It requires about two hundred and fifty pounds of iron, and the same quantity of sulphuric acid, with one hundred and fifty gallons of water, to generate one thousand cubic feet of gas, but a great deal depends upon the man in charge of the plant as to the quantity actually obtained.

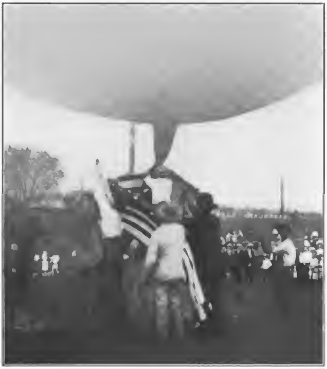


FIGURE 7

TYING UP THE APPENDIX

Three covered tanks placed side by side are necessary for generating hydrogen (see figure 9). The iron is put into the first one and it is then half filled with water. Through a hole in the cover of this tank a lead pipe is inserted and reaches nearly down to the iron in the bottom of it. Connected to the top of this pipe, but outside the cover, is a lead funnel, through which the acid is poured into the tank. On the opposite side is another pipe, which only passes just through the cover, and as the gas generates, it rises and passes through this pipe into the next tank which is about one-third full of water. The second tank is called the washer, as the gas only passes through the water on its way to the third tank, where it passes through lime, after which it is carried along a pipe or tubing, the other end of which is attached to the appendix, into the balloon.

When the balloon is fully inflated, the gas pipe is disconnected, and the appendix is tied up with a narrow strip of cotton material to which a string is attached (see figure 7); this is to prevent loss of gas while making further preparations for the trip. The string is carried down into the car and when the proper time comes, which is as soon as the balloon gets away, a sudden jerk on the string will break the material with which the appendix is tied, leaving it open. After the appendix is tied the balloon is allowed to rise several feet from the ground to allow the load-ring to be attached to the suspension lines, and the car to the load-ring. Figure 8 shows the method of attaching the load-ring and the car to the balloon. Twenty-eight short lengths of rope are spliced on to the ring and at the loose end of each a toggle is fastened. The suspension lines, of which there are eighteen, are each finished off with a loop which is slipped over the toggle. The car of the balloon has ten ropes by which it is attached to the load-ring. These ropes are passed down one side of the car, under the bottom and up the opposite side, becoming a part of the car, by being woven with the wicker of which the car is made. The end of each car rope is spliced in a loop (which makes it an endless rope) and is slipped over one of the ten remaining toggles, in the same manner as the suspension lines. This method of attachment is the simplest one imaginable, and as safe as it is simple. After attachment all is ready for the start, as the car has previously been fitted up with everything necessary for the journey.

A balloon equipment consists of the following: anchor and anchor rope; a drag-rope, which is fastened to the concentrating ring and is always hanging down from the outside of the car, this being one means of equilibrium; a statoscope, which indicates whether the balloon is rising or falling; a barometer, with a self-registering chart; a compass, which indicates which way the balloon is travelling; seventy-five to a hundred sand-bags, as ballast; rugs; lunch basket; a cover to fit the car and a cover for the deflated envelope, making two convenient packages for expressing to any desired point. Everything appertaining to a balloon, with the exception of the envelope, will pack into the car, which makes transportation quite easy.

The balloon being built and now ready to start, all that is desirable for a delightful day of exhilarating, lung-filling sport, are clear weather, congenial companions and a favorable breeze.

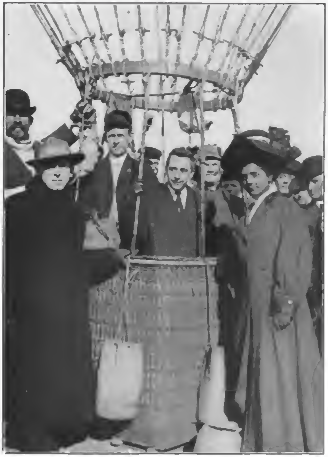


FIGURE 8

SHOWING METHOD OF ATTACHING LOAD-RING AND CAR TO BALLOON

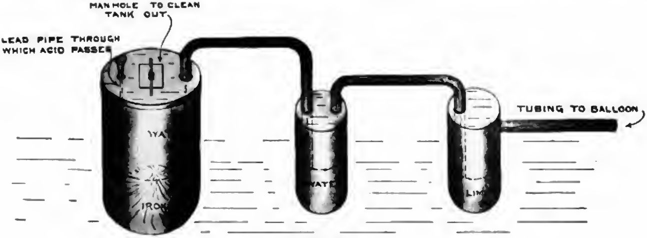

MAN HOLE TO CLEAN TANK OUT
LEAD PIPE THROUGH WHICH ACID PASSES
TUBING TO BALLOON
WA
IRON
WATE
LIM

FIGURE 9

HYDROGEN GAS GENERATING PLANT

Drawing by the Requa-Gibson Co.

EDITORIAL

A SPECIALIST

IN THE OLDEN DAYS, when our industrial life was not quite so complex as at present, the village barber was qualified to pull teeth, preach a sermon, administer to the lame, shoe horses and do many other things as his daily avocation. He also talked about flying machines on rare occasions; but he never became an expert on anything. He was a general all-round botch, and his information on any subject was ridiculously faulty.

In these days men are trained along certain special lines, which enable them to become experts. One man will devote his whole time and attention to the study of one subject, while another man will give all of his time to the study of another, and so on. No one ever thinks of going to the barber nowadays to have his teeth repaired or his automobile shod. These are the days of the specialists, and they are patronized because by giving all of their time to one little branch of human endeavor they acquire greater knowledge and skill than they would if trying to learn a dozen vocations at once.

AIRCRAFT is a specialist. It is interested in nothing else but balloons, flying machines, kites, etc., and that is all you can expect to find in it at any time.

But upon this subject it is an expert, and anyone who is anxious to secure absolutely reliable information concerning the science of aeronautics or the aeronautical movement generally, must read this magazine.

We employ only expert Editors, and publish articles written only by men who are in the front ranks of aeronautical writers.

There are some people foolish enough to think they can acquire a general knowledge of aerial flight from the newspapers or nonsensical articles appearing in general magazines, but you always know these men as soon as they begin to discuss their subject.

If this great subject is worth knowing at all it is worth knowing right, and we advise everyone interested in it to subscribe for a magazine that makes aerial flight its specialty.

o o o

The Aeronautic Society of New York is to be congratulated upon its selection of Hudson Maxim as President for the coming year. A more capable leader could not be found anywhere. The make-up of Maxim consists of exceptional intelligence, untiring energy, plenty of enthusiasm and a considerable knowledge of mechanical flight; he has also sufficient means to back him up in his undertakings.

Lee S. Burridge, that calm, considerate logician, was elected Vice-President and the indefatigable Hugo Gibson, a Director; which simply means that the Aeronautic Society has a triumvirate of very brainy men, who, when once they get working harmoniously together, will produce results beneficial to the entire aeronautical fraternity.

o o o

"How could a human being live ten miles up in the atmosphere, where there is little or no oxygen to breathe?" inquires an anxious reader, referring to our Editorial in the March number of AIRCRAFT on "High Flying."

How DOES a human being live in a submarine boat fifty feet under the water? is a question we might ask of the inquirer and his answer to our question would probably answer his own.

Take a supply of oxygen along for the purpose.

The drawback of flying at high altitudes is not the lack of oxygen, which can be taken up for the purpose, but the lack of air pressure. Man's ingenuity to overcome OBSTACLES will, however, find ways and means to overcome this difficulty just as he has found ways and means to overcome every other drawback met with in his path towards progress during the past.

o o o

Captain Thomas S. Baldwin, builder of the only war dirigible the United States Government owns, and whose name will always shine forth as one of the greatest pioneers of aerial transportation, has entered the field of aviation and constructed a biplane.

Baldwin's long experience as an aeronaut and his superior knowledge of everything pertaining to aircraft generally, will aid materially toward his ultimate success with a heavier-than-air machine.

o o o

We are always ready to publish any good article relating to air-craft, whether partisan or otherwise, as long as it offers genuine information tending to throw light upon any question or controversy. Publishing the articles, however, does not always mean that we accept the opinions expressed therein.

THE WRIGHT-CURTISS-PAULHAN CONFLICT

By George F. Campbell Wood

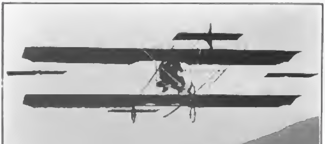
HAD it occurred but three short years ago, it is doubtful whether the legal conflict now being waged over the Wright Brothers' patent of 1906 would have caused more than a flicker of interest outside of those directly concerned.

As it is, the struggle over the question, whether the Wrights' emulators in the field of mechanical flight are also their imitators, has elicited a show of interest which would be surprising were not its very causes—the lightning-like developments of the last two years and the strange possibilities they suggest to any but the least creative of imaginations—not themselves far more surprising.

It is a truism that the most complex and intricate questions and those most difficult of a solution equitable to all concerned are also those of which the most opinionated views are held: the Wright-Curtiss and Wright-Paulhan suits are no exception to the rule and the depth of conviction of the Wrights' partisans as to what should be the outcome of the litigation is only equalled by that of the anti-Wrights.

When the many-sided aspects of the case, together with the intricacies of the patent-laws, the ambiguities and delicacies of interpretation to be contended with, and also the obvious sincerity of the litigants and the far-reaching consequence a decision one way or the other may have, are considered, it seems more hesitancy should be shown in jumping at conclusions, in either direction.

Broadly speaking, the Wrights claim that anyone who makes profit out of an aeroplane in which the lateral stability or equilibrium is maintained through the simultaneous action of a rear vertical rudder and of any contrivance to increase or diminish the wind-resistance or air-pressure on one side of the main planes, is infringing one of their patents.



HERRING-CURTISS BIPLANE, SHOWING INTERMEDIATE PLANES FOR LATERAL CONTROL

Every aeroplane, be it a Wright or a Blériot, a Voisin or an Antoinette, a Herring-Curtiss or a Farman, or any other of the many varieties now being turned out, has a vertical rudder, in the same way that every boat or ship has, although it is a debatable point whether it acts in just the same manner.

Most aeroplanes of the present day—the Voisin biplanes are a signal exception in this regard—also have means to increase the wind-resistance or air-pressure on either side of the main planes, and some have the means to diminish it on one side when it is increased on the other, with the idea of adding to the effectiveness of the operation.

Of the four machines concerned in the present law-suits—the Wright, Herring-Curtiss, and Farman biplanes, and the Blériot monoplane of the "Cross-Channel" type—the Wright and the Blériot XI increase the air-pressure on one side and diminish it on the other by a deformation or warping of the main surfaces or wings: a very simple system of wires and pulleys acts on the rear-edge of the extremities of the wings in such a way that when one side is pulled down the other side is pulled up; the angle made by the planes with the direction of flight—usually referred to as angle of incidence or of attack—is thus made larger on one side (increasing the resistance to forward and downward motion) and smaller, null or negative on the other side (diminishing the resistance to forward and downward motion). Thus in straightaway flight, if the aeroplane is leaning to the right, a greater angle is given to that side of the main planes, to make it rise, and a smaller one to the left side to lower it—and the aeroplane will quickly assume an even keel. In the Wrights' machine and, they claim, in the Blériot also, the difference of resistances produced on either side will create a turning tendency towards the side made to offer a greater resistance to forward motion—the right side in this case—and it is to remedy this that the rear rudder will be turned in the opposite direction—to the left. When making a turn it is necessary to tilt the machine down, towards the inside of the curve, like with a fast-moving land-vehicle. The outside edge being warped to obtain this lift will create a retarding effect tending to turn the machine the opposite way to that it is desired to go, but the tilt of the machine, for reasons unnecessary to analyze here, will itself create a stronger turning effect in the proper direction, and it is this conflict of forces at the outset of a turn which makes the exact operation of wing-tips and rudder, while turning, a subject of such ardent controversy.

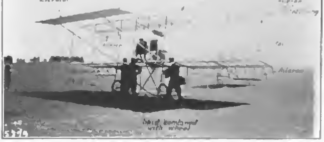


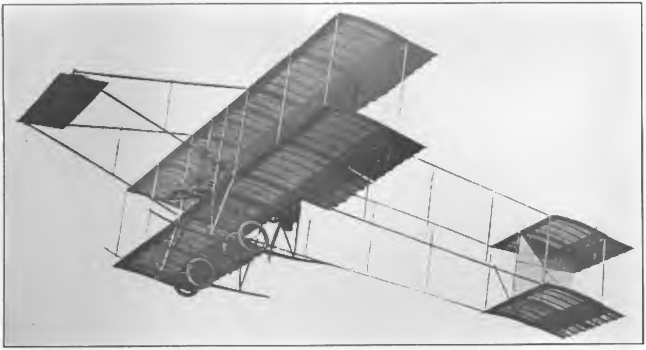
Photo from "Airships in Peace and War," by R. P. Hearne.

HENRY FARMAN BIPLANE, SHOWING HOW THE "AILERONS" HANG DOWN WHEN NOT IN FLIGHT

In the Herring-Curtiss machine the main planes are rigid and their shape cannot be changed by the operator; on either side of the biplane and between the main planes are two small auxiliary surfaces hinged on their forward edge and so connected that one will turn up and the other turn down, when the operator leans one way, and vice-versa. The added resistance of the one turned down will create a lifting effect on that side of the aeroplane, but Curtiss contends that in his machine no retarding effect on one side and accelerating on the other—in other words, no turning movement—is brought about; these small planes, he argues, do not normally make any angle with the line of flight, being parallel with it when neutral; thus, when they are operated the one turned up makes just as great a retarding angle as the one turned down, and the only effects of the manœuver are to right the machine—as desired—and to offer a very slight check to the speed.

The Wrights answered that this supposed the angle of incidence of Curtiss's main planes to be rigorously constant (for there could only be one fore-and-aft tilt of the machine in which the auxiliary planes would be both absolutely parallel to the line of flight), and that this did not occur in practice, for the slightest change in the power produced by the engine or in the weight carried—such as a loss of weight through consumption of fuel and oil—would cause a machine to move at a changed angle with the line of flight, when flying horizontally; also, the angle would be materially changed, when seeking different levels, and it was doubtful if the small surfaces ever exactly counter-balanced each other, when acted on, for their use in itself would change the general angle of incidence, through the slight check in the speed of the aeroplane which their combined resistance to forward motion brought about.

When in Los Angeles, and more recently, at Hammondsport, N. Y., Curtiss made flights with his rudder tied up, to prove that the use of the auxiliary surfaces had no turning effect on his machines. The idea was that any tendency to turn would have been clearly noticeable, for no rudder would have been available to correct it, but Curtiss would, no doubt, be required to make several official tests under different conditions of load, power, and grade of flight, and in a wind sufficiently perceptible for its puffs to call for the use of the auxiliary planes, for them to be accepted as refuting evidence of the Wrights' contention.



PAULHAN'S HENRY FARMAN BIPLANE WITH WHICH HE BEAT THE WORLD'S HEIGHT RECORD LAST JANUARY, SHOWING THE POSITION OF THE HINGED "AILERONS" WHEN IN FLIGHT. THE PROPER SPEED OF THE AEROPLANE BEING FORTY-FIVE MILES AN HOUR, IT IS CONSTANTLY MEETING A "WIND" OR CURRENT OF AIR OF THAT SPEED WHICH SUPPORTS IT LIKE A NATURAL WIND SUPPORTS A KITE. THIS FORTY-FIVE MILE "WIND" TENDS TO PUSH THE AILERONS UP IN THE LINE OF FLIGHT AND KEEP THEM THERE.

The Farman biplane, which is the machine in which Paulhan has been breaking American and World's records in the West, has neither warping wings, nor auxiliary surfaces between the main planes; it has, however, four such surfaces hinged on the rear and extreme part of either plane; they are referred to by the Wrights as a hinged *portion* of the main surface and by Paulhan as a "flap," *added* to the main planes. In France, they are called "ailerons,"—little wings.

The contention was made that when Paulhan pulled the right *ailerons* down, to increase the resistance on that side, the left ones were pulled up, but it would appear that only the *ailerons* of one side are worked at a time and no negative angle is made by the others; these are then totally uncontrolled, like a weather vane on a horizontal axis, and remain parallel to the line of flight, following horizontally in the wake of the planes like a flag does vertically on the stern of a swift steamer, on a calm day. Paulhan could not therefore claim that they counterbalanced their retarding influences, as Curtiss does for his machine. He does claim, however, that when not acted on, they are both perfectly free to flap in the wind and, because they support nothing, cannot be considered as part and parcel of the main supporting surfaces. Whether they would become part of them, when starting off the ground or when going up a grade—like in his great flight at Los Angeles, for instance, where, for over forty minutes, he kept climbing at an average vertical rate of a hundred feet a minute—would seem to rather depend on the slack in the controlling ropes; the greater the angle of incidence the longer the rope would have to be to enable the *ailerons* to fly freely in the line of flight—at a corresponding angle with the planes.

The wording of the Wright patent is as follows: ". . . causing that side of the main supporting planes to assume "greater angles of incidence . . ." but Paulhan's counsel did not feel he could build his case on the argument that the Frenchman used auxiliary non-supporting planes to get his lifting effect. The argument returned would have been, no doubt, that the lowering of the ailerons *did* give an increased angle of attack to that side of the *main* planes and that the *distinction* in the cause made no *difference* in the result.

It is, nevertheless, surprising that more importance was not given by Paulhan's representatives to this side of the question, and it seems likely that much more will be made of it at the re-hearing of the case.

Practically the whole history of man's attempt to fly from the legend of Dædalus and Icarus to the present day was gone over by both sides in the recent hearing before Judge Hand, where the Wrights successfully battled to obtain a temporary injunction against Paulhan.

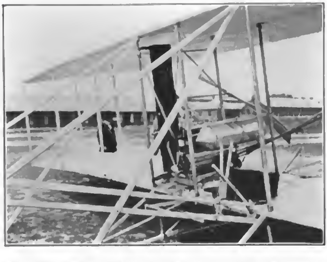
This was done, either to show how the Wrights had succeeded where hundreds had failed before them, or to show that many of their immediate predecessors had formulated the principles and conceived the ideas embodied in their flyer.

The Wrights conceded that the vertical rudder had been known and used long before them, but they claimed the first practical conception of warping wings.

The relation of the efforts made in this direction some decades ago, by the Comte d'Esterno, by Le Bris, and by Mouillard were fairly easily met by the Wright forces, who showed how vague, unsatisfactory, inconclusive, and, in some cases, untried, had been their conceptions to increase the air-resistance on one side of a winged machine. The very ingenious, but terribly complicated, steam-driven flying machine of Ader, the French electrical engineer and telephone inventor, was then brought up. Like Mouillard, Ader had journeyed to many wild climes for the express purpose of watching the great soaring birds of the tropics on the wing, and had even gone so far as to import from India, some large vampire-like bats, which he let loose in his laboratory, in Paris, and tirelessly watched, in his efforts to wrest from nature the secret of flight. He discarded flapping-wing machines, but his conceptions, nevertheless, remained far too close to nature to be practical, and it would appear to be more their lack of simplicity than the want of a suitable motor, which prevented his realizing his life dream. His machine of 1890 had warping wings, and, like those of the Wright machines, they were so arranged that when one was warped down the other was automatically warped up, but this faculty was complicated with many others, as ingenious as they were superfluous.

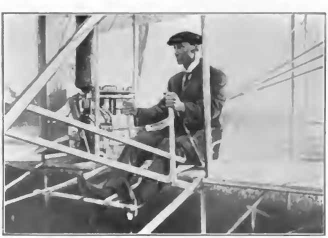
This machine is now generally admitted to have skimmed a few inches above the ground for fifty or sixty yards on the afternoon of October the ninth, 1890, and thus to have been the first mechanically propelled machine to have ever lifted itself clear of the earth, but nothing shows that the problem of equilibrium was in any way solved, nor was it in his later machine, the "Avion," which is credited with having covered a thousand feet in continuous flight, in 1897.

The famous gliding experiments made in Germany and England by Lilienthal (1891-96) and by his disciple Pilcher (1897-99) were then broached, as well as those carried out by Herring and Avery, at about the same time, on the shores of Lake Michigan and under the direction of Octave Chanute, the "Grand Old Man" of American aeronautics, who was later to be for the Wrights, a collaborator, a counselor, and an adviser.



SEMI-INDEPENDENT CONTROL OF RUDDER AND WING-WARPING ON WRIGHT BIPLANE USED AT FORT MYER IN 1908 BY ORVILLE WRIGHT (THE FIRST FLYING MACHINE TO EVER MAKE A CONTINUOUS FLIGHT OF ONE HOUR).

THE TWIN LEVERS TO BE CONTROLLED BY THE AVIATOR'S RIGHT HAND AND STANDING AT AN ACUTE ANGLE TO EACH OTHER IN THE PHOTOGRAPH ARE THOSE WHICH ACTED ON THE RUDDER AND WINGS; THEY COULD ONLY MOVE IN A FORE AND AFT DIRECTION AND MOVED TOGETHER, BUT THE AVIATOR COULD SLIGHTLY ALTER THE RELATIONSHIP OF THE RUDDER'S DEFLECTION TO THE WING-WARPING BY BRINGING THE LEVERS TOGETHER WITH HIS FINGERS.



INDEPENDENT CONTROL OF RUDDER AND WING-WARPING ON WRIGHT BIPLANE USED IN FRANCE IN 1908 BY WILBUR WRIGHT (THE FIRST FLYING MACHINE TO EVER MAKE A CONTINUOUS FLIGHT OF TWO HOURS) AND EMBODIED IN ALL WRIGHT MACHINES BUILT SINCE THEN.

THE SINGLE LEVER IN MR. WRIGHT'S RIGHT HAND CONTROLS THE VERTICAL RUDDER WHEN MOVED BACKWARDS AND FORWARDS AND THE WINGS WHEN MOVED FROM SIDE TO SIDE. (SEE DIAGRAM OPPOSITE).

But none of these had solved the problem and the two first had perished in their attempts to do so.

The balancing ideas of Mattulah, as exposed in an affidavit of Professor Zahm, of Washington, and the patent of Boswell for an "airship-rudder," in which vertical and horizontal surfaces were actually connected for steering purposes, were also brought up to quash the Wrights' claim to priority, but the Court was of the opinion that where conceptions had not been executed, some proof should be shown, in the light of later experiments, that, if executed, they would have been capable of fulfilling the purpose for which they were designed.

It was then contended that Ader, Maxim, and Langley would have flown had they had the modern gasolene engine at their disposal, but the Wrights objected that the engine of their flyer of 1903 weighed far more to the horse-power than the steam-engines of these famous scientists, and that much of the four hundred thousand dollars spent on the problem by these three was represented by the remarkable engines they turned out—engines which were recognized as marvels of compactness, lightness, and ingenuity.

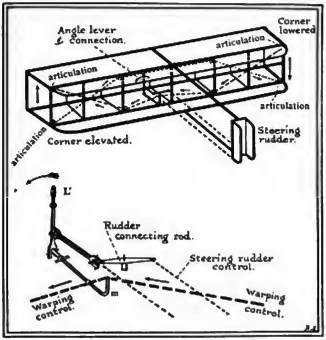
In the case of Maxim's huge machine it would not have been possible to obtain such a ratio of efficiency per horse-power in a small engine, and the smaller the flying-machine the greater its chances of success, but with Ader and Langley, the objection appeared to be well founded.

It was also pointed out that Langley's last model had a gasolene engine, and a difference of views was expressed as to the cause of the final plunge of his machine into the Potomac; but with Judge Hand unsatisfied that priority had been proven by Paulhan, either in a successful conception of increasing the incidence of flying-machines' wings—although the priority of the *idea* was admitted—or in the use of such appliances in conjunction with a vertical rudder, the whole question resolved itself in whether Paulhan's machines operated as the aeroplane described in the Wright patent of 1906 and whether the present-day Wright flyer itself did so.

The latter part of the question came up first.

The Paulhan legal forces had failed to convince the Court that anyone had designed a practical steering device or combination before the Wrights; they had argued in vain that any such device was, after all, only an adaptation of the principles of nature, observed for hundreds of years in birds and fish, that only the difference in the engines at their disposal and in their personal skill as aeroplane-drivers and operators had prevented the predecessors of the famous brothers from doing as well as they did, and that as principles of nature and personal skill could not be made the bases of an operative patent, no claim of infringement could be sustained; they had failed thus far, but the history of the Wrights' progress in the art of mechanical flight bade fair to afford them an argument of some legal potency.

As mentioned above, the Wright patent calls for the simultaneous use of a rear vertical rudder and of a contrivance enabling the operator to create a difference in the incidence of the wing-tips, when the occasion so requires, for balancing or turning purposes, but it also qualifies the manœuvre by calling for "means whereby the said vertical rudder is made to present to "the wind that side nearest the side of the main planes having "the smaller angle of incidence."



From "The Conquest of the Air," by Alphonse Berget.

DIAGRAM SHOWING HOW IN THE PRESENT-DAY WRIGHT BIPLANE A SINGLE LEVER IS MADE TO INDEPENDENTLY CONTROL THE WARPING WING-TIPS AND THE VERTICAL RUDDER.

It must be borne in mind that this patent, although granted only in 1906 was filed early in 1903, at a time when the Wrights had practically solved, on their gliders, the problem of lateral equilibrium in a straightaway flight, but eight months before their first, and epoch-making flight in a motor-driven aeroplane, eighteen months before they succeeded in making their first turn (September 15, 1904) and two and a half years before they were able to make turns with any reasonable degree of certainty. In the glider or motorless aeroplane they were operating at the time the patent was applied for, the turning of the rudder was entirely dependent on the warping of the wings—the controlling wires being purposely so connected that when the incidence was increased on the right side, for instance, the rudder turned to the left.

The Wrights have since stated over their signature* that it was in September, 1905, that they suddenly made the final discovery which enabled them to henceforth undertake turns with safety. From then on, their flights, which had previously never exceeded five minutes in duration, rapidly increased in length and nothing short of a lack of fuel or an over-heating of the engine would stop them.

They were thus able to announce to the world—in October, 1905—that they had evolved a practical flying-machine.

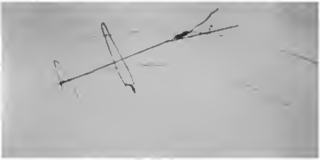
How could it be asserted, Paulhan's counsel demanded, that, previous to the discovery they themselves claimed to have made in 1905, the Wrights' aeroplane was practicable for turning purposes? And how could it be asserted that this patent (made out more than two years before this discovery as to how turns should be made), did not embody an impracticability of manœuvring? "Even if the machine attacked and the present "Wright machine *did* act similarly, argued Paulhan, there could "be no infringement as they *neither* of them came under the old "Wright patent."

As to why the Wrights did not or could not obtain further patents relating to their improvements of 1905, no opinions were vouchsafed: certain it is that the brothers ask no leniency from the Courts in this regard; they maintain that their patent is sufficient in all respects, that it entails no impracticability of manœuvring and that the later developments in steering-facilities are not indispensable.

It is believed by many that the improvement of 1905 consisted in rendering the rudder-control and that of the wing-tips partially or totally independent of each other—as they now are in the Wright machines.

It is hard to construe the wording of the patent as indicating anything but a direct connection between rudder-control and warping, so that the rudder would act as it actually did in the glider or in the model-glider shown in Court.

But Judge Hand seemed inclined to give this a broad interpretation, if it could be shown that the present-day *disconnected* rudder would, by force of necessity, always be turned to the side indicated in the patent.



PHOTOGRAPHIC REPRODUCTION OF THE ORIGINAL SKETCH MADE IN COURT, FEBRUARY 10TH, BY WILBUR WRIGHT, TO EXPLAIN TO JUDGE HAND HOW, IN A TURN, THE RUDDER MAY PRESENT TO THE WIND THE OPPOSITE SIDE TO THAT WHICH NORMALLY MEETS IT.

THE MAIN BODY OF THE AEROPLANE AND THE SIMILARLY-SHAPED FORWARD RUDDER ARE EASILY RECOGNIZED.

THE AEROPLANE IS MOVING FROM RIGHT TO LEFT AS THE LOWER ARROW SHOWS; THE DIRECTION OF THE CURRENT OF AIR STRIKING THE REAR RUDDER IS SHOWN BY THE OTHER ARROW.

AS CAN BE SEEN, THIS CIRCULAR CURRENT STRIKES THE RIGHT SIDE OF THE RUDDER, EVEN WHEN THE LATTER IS PERCEPTIBLY TURNED TO THE LEFT.

An argument ensued as to the comparative effects of an aeroplane-rudder and that of a boat or ship; the Wright Brothers' representatives expressed the opinion that they acted in a radically different fashion, but the Court seemed to consider the distinction more apparent than real; certainly the rudder-action of a power-propelled boat is totally different from that of an aircraft, through its very simplicity, but who would say that the warped wings and tilted rudder are not only comparable, but positively suggestive of the combined, helpful, corrective or counteracting cooperation of rudder and sails in a sailing boat or vessel? The flyer moves in three dimensions and the boat in two, it is true, but the forward horizontal rudder is there to take care of one dimension and it is doubtful, furthermore, if an aeroplane ever tilts as much as a sailing-boat. The differences are, of course, obvious enough, for the aeroplane makes its own wind and its control is all exercised in one element—being analogous, on this point, to a submarine—but a rudder is a rudder for all that, and has the same general effect, whatever may be the fluid in which it is propelled and however tenuous and elastic that fluid may be.

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* Century Magazine, September, 1908.

So thought Judge Hand, and a certain deadlock ensued in the proceedings.

"Is there not some moment when making a turn"—the Court wanted to know—"in which the rudder is turned on the side "of greatest incidence?" but the oft-repeated query received no elucidation until Wilbur Wright himself, who had so far refrained from interrupting his counsel, quietly stepped forward, pencil in hand, and drawing the Court's attention to the words in the patent: "is made to *present to the wind* that side nearest "the side of the main planes having the smaller angle of inci-"dence," and to the fact that the "wind" referred to is, of course, the artificial flow of air made by and met by the aeroplane—a flow, which is, of necessity, exactly opposed to the direction of flight—made a rough sketch, in which the circular course of the machine, when turning, and the exactly opposite circular course of the "wind" were shown by curved and parallel arrows.

He went on to explain that the aeroplane being rigid in its longitudinal axis could not itself assume any curve and that, because of this, the rudder, when in what would ordinarily be a neutral position, would nevertheless, in a turn, be undergoing a certain pressure on one of its sides and might even be doing so when slightly turned towards the other side. Thus, with the rudder turned toward the side of the main planes presenting the greater incidence, it would still be "presenting *to the wind*" that face nearest the side of smaller incidence, and only when this occurred would the rudder *ever* be turned to the side of greater incidence.

The Judge's puzzled expression changed to one of comprehension, on Wright's explanation, and from this moment it appeared that only a challenge of its accuracy or an acquiescence to it as regards the Wright machine coupled with an assertion that Paulhan's machine acted in a contrary manner, could save the Frenchman's case.

The Court was on the verge of ordering an attachment of the prize-money being now won by Paulhan, pending its decision on the injunction, when, in the same dramatic manner that Wright had stepped in to turn the scales in his favor, the opposing expert, Mr. Israel Ludlow, came forward with a pertinent question concerning the exact turning manœuvres of a Wright aeroplane-driver and on Wilbur Wright's answer declared that Paulhan's affidavit showed that he acted in quite a different manner.

He also dwelt on the difference in the mode of construction of the Wright and the Farman, asserting the latter had far greater natural stability.

It is reasonable to suppose that the turning influence of warping the wings is far greater than that of operating *ailerons*, and it is likely that, in turning, the change of incidence of the planes is a greater factor in the Wright machine than the handling of the rear rudder; in fact, the first Wright gliders had no vertical rudder at all. In the Farman, on the other hand, the main factor might well be the rudder and the *ailerons* merely the assistants.

As was to be feared for Paulhan, however, Judge Hand considered this a distinction without a difference, and, being satisfied that both *ailerons* and rudder are brought into play, rendered a decision against him, and granted the Wrights a temporary injunction, even as Judge Hazel had decided against Curtiss. The use of the *ailerons* may be far more casual and unusual than the continual, bird-like warping of the Wrights' wings, but, thought the Court, it is the principle itself which is involved and not the frequency of its use or its mode of appliance.

Certainly if Paulhan discards his *ailerons*, the Wright brothers would have little to say, but the most enthusiastic partisans of the famous French bird-man cannot but think of such a wing-clipping operation, without some misgiving; in fact, there is every reason to believe that had Paulhan the choice of discarding either *ailerons* or rudder, it would be the latter he would sacrifice.

The discussion has chiefly waged over the Farman machine, because that is the one Paulhan has been doing nearly all his flying on in America and the one, be it noted, which at this writing holds all world's records of height, duration, and distance, with and without passengers.

But the fate of the Blériot in this country is also at issue.

It is the impression of the writer that, as far as Paulhan's Blériot is concerned, all the argumentative eloquence indulged in was sadly wasted, as he has been for some months in possession of information convincing him that the warping devices of these particular Blériots were removed before they were delivered to Paulhan, at Pau, last December, and that the wings were thus fixed and immovable.

Whether because of this change, or for any other reason, Paulhan cannot count on making a good showing with the Blériots, except in perfectly calm weather, which is perhaps the reason his counsel here were never informed that there could be no question about the right of the Blériots to make whatever flights they were capable of.

The arguments adduced against the Wrights, however, are of interest, in case it is sought to use here unmodified Blériots of the standard type. They were succinctly as follows: "The Blé-"riot is a direct descendant and derivative of the early types of "monoplanes, from which all its faculties have been taken.

"It has the surfaces, the vertical and the horizontal rudders "of the first monoplane ever conceived, that of Henson in 1842; "its tail is of the well-known Penaud type (1871). Ader's Eole "of 1890 is obviously its ancestor: single surface, single tractive "propeller in the prow, the Blériot and Eole have in common, "whilst the Wrights' is a biplane, with twin propulsive propellers "in the rear.

"It is true that like the Wright machine, the Blériot has "warping wings and a vertical rudder, but Ader's conception cer-"tainly numbered the former among its attributes, and drawings "representing its profile appearance show a vertical rudder (let it be said in parentheses, however, that Ader, who hated to get away from nature, did not deem a rudder a necessity).

"Thus the best ideas of the unsuccessful Ader were taken "up by the successful Blériot."

Blériot himself, in a recent interview, expressed the opinion that the simultaneous use of wing-tips and rudder was not patentable, but that the single lever for the purpose, was; in other words, that the Wrights could only claim a patent on the means used by them and not on the principle involved.

Blériot added that he would be willing to pay a royalty for the single lever, as he considered it a desirable improvement. The hero of the Channel Crossing also held that, in his machines, most of the balancing was done automatically by the long tail with which they are fitted, and that this is why, if necessary, the warping mechanism could be done away with and the monoplane would still be capable of flight.

Paulhan made several short flights at Los Angeles with his Blériot, the wings of which were thus paralyzed, as explained above, but like Curtiss's contention, Blériot's would have to be proved by actual experiment *in disturbed air*. The reference to the tail, however, is significant.

The present litigation has divided the flying-machines now in America into just two classes: the non-Wrights and the Wrights, and it is curious that this distinction coincides with one of the main bases of classification of aeroplanes: those with tails and those without (taking the word "tail" at its usual aeronautical meaning of a *fixed* horizontal surface in the rear).

With the exception of the Cody biplane, in England, the Wright is the only successful machine normally built without some fixed horizontal surface in the rear; and as, when tilted, horizontal surfaces develop vertical resistances, the assertion that a "tail" exercises a certain effect, as regards lateral balance, seems a fairly plausible one.

The Wright brothers, however, would probably meet any such flank movement on their positions with the statement that they adapted a tail to the machine they sold to the Army recently and saw no reason to modify their manœuvres to obtain lateral control, in consequence of the change.

Whether the Wrights themselves realize just what the forces are which they have to contend with when changing the equilibrium or course of their flyer, was another point brought up, although its relevancy was not very clear.

It is to be hoped a decision in the matter will not be deemed necessary: aeronautical experts are agreed on the broad lines of the question, but their testimony on the finer points raised would be liable to differ as much as that of their confrères in handwriting; the debate over tilt, drift, and side-slip, center of pressure, inertia, and centrifugal force would wax heated indeed and the difficulty of deducting absolute facts from a maze of learned hypotheses would be the only obvious point in the controversy.

When all is said and done it would seem as if the views of Wilbur and Orville Wright were at present being sustained; Curtiss and Paulhan have obtained rehearings, however, and the fight will, no doubt, continue from Court to Court for many months to come.

Whether the Wrights will ultimately gain their point, it is at this time hard to say, but if it is for a moment admitted that they will do so, there is still room for ample discussion on what might variously be called the social, moral, and sentimental aspect of the case: whether their attitude and action would not retard the progress of their country in the new art, and, if so, whether they would be justified in bringing about such a state of affairs.

This side of the question is just as open to debate as its legal aspects—which is saying anything but little—but it would be beyond the scope of an article which merely aims at opposing, in the simplest manner compatible with the complexity of the questions at issue, the claims made on either side in what promises to be as "Célèbre" a "Cause" in the annals of Aeronautics, as the Bell and Selden lawsuits were in those of two other of the greatest inventions of modern times.

ARE THE WRIGHTS PIRATES?

By V. L. Ochoa

NOW that the "mysterious" Wright Brothers have unveiled themselves and are attempting to appropriate all the glory attached to the building of flying machines, and all the money resulting from the manufacture of them, now that they are attempting to enjoin other inventors from reaping the just reward of their hard work, it may be well to consider one or two flying machines, which were constructed many years before the Wrights produced anything worthy of notice, and to ask these brothers of mystery just how many ideas they appropriated from the long list of inventions which preceded theirs.

SIR HIRAM S. MAXIM IN HIS LABORATORY

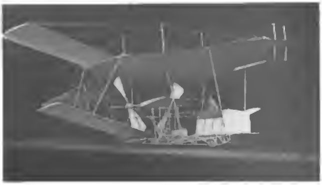
Among the earlier of the more serious attempts made to construct a machine that could fly, were those of the great Peter Fenimore Cooper, who suffered the loss of one eye in seeking to find an explosive suitable to an engine that would propel a machine of the helicopter type.

In 1890, Ader, a French electrical engineer, in France, made the first mechanically propelled flight. The Ader machine possessed all the essentials of the now famous Blériot machines, which, it must be said, fly at a loss of 60 per cent. of their power.

About the same time (1891 to 1896) Lilienthal, the German engineer, was keeping Europe thrilled with his daily flights with gliders.

And all this time the most stupendous experiments and work yet made by man were being carried on by the one who may rightly be called the father of the aeroplane as it is made to-day. This man was Sir Hiram S. Maxim; his machine may be said to have embodied in all essentials the very features employed by the men now flying.

In 1894, after years of protracted and searching experiments of the most painstaking kind—experiments which cost the relatively enormous sum of nearly half a million dollars—Sir Hiram S. Maxim constructed at Baldwyn Park, Kent, England, an aeroplane of remarkable design and marvelous workmanship, a machine, the dimensions of which were 104 feet from tip to tip of the main planes, a machine possessing a vertical front rudder similar to that now used by Paulhan and by the monoplane-builders, Blériot, Antoinette, Santos-Dumont, and other flyers. This great machine also had the main planes superposed just as the Wrights, Farman, and others have theirs to-day. It was also mounted on wheels as are those of Farman, Curtiss, Blériot, Dumont, and others.



MODEL OF MAXIM'S MACHINE, SHOWING FORE AND AFT HORIZONTAL RUDDERS AND THE SUPERPOSED PLANES

The Maxim aeroplane, the largest ever constructed, had two huge propellers nearly 18 feet in diameter, between and to the rear of the main planes, and placed much as are now located the well-known twin propellers of the Wright Brothers These propellers were also connected to the shaft of the engine just as Wrights' are on their flyer.

The wheels of the machine ran on two rails, while the Wrights run theirs on trucks and wheels and one rail, leaving their wheel-trucks on the ground after starting; only in this respect does their running-gear differ from Maxim's machine, which left the ground nine years earlier.

The lifting surfaces of this great aeroplane had a spread of 6,000 square feet and were capable of lifting several tons. To understand its enormous size one has only to understand that the Wright aeroplane has but one-tenth of the lifting surface employed by the Maxim machine. Maxim's steam engines developed power enough to propel his great machine at tremendous speed, and could have kept it aloft for many hours; this power amounted to 360 H. P., and the propellers gave a direct thrust of 2,164 pounds, whereas the engines of the Wrights, which are only about 25 H. P., could not possibly impart to their twin propellers a thrust of more than 230 pounds, and perhaps not as much as that.

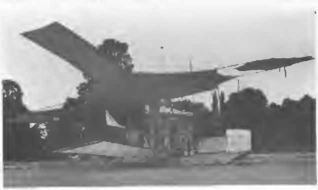
By careful comparison it will easily be seen that the Wright Brothers succeeded in most ingeniously reproducing the main features of Sir Hiram S. Maxim's ill-fated machine, though somewhat on a miniature scale, copying most faithfully his appliances, even as far as the starting rail used for the purpose of launching the machine at the requisite speed for sustentation.

On pages 148 to 158 of *McClure's Magazine* for January, 1894, as well as in the *Scientific American* of April, 1894, a full and detailed account is published over the signature of H. J. W. Dammd. It is replete with illustrations of Maxim's machine, which actually flew, only to wreck itself at the very threshold of success.

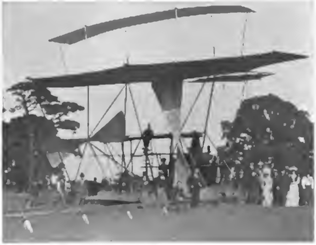
Mr. Octave Chanute, who made and experimented several gliders in the closing decade of the last century, and who is credited with having furnished the Wrights with suggestions and data, was, no doubt, thoroughly conversant with Maxim's work and machine, and there is little doubt that the Wrights through him, if not through the direct reading of daily reports and magazine articles, came into possession of the facts. It was nine years after Maxim (in December, 1903), that they made their first flight in a miniature imitation of Maxim's machine, to which were added their own ideas.

Here is Sir Hiram Maxim's own account of his experiments with his large machine and here are all the tell-tale photographs which will convincingly show just where the Wrights may have got their forward rudder, their superposed planes, their twin wooden screw propellers to the rear, their shaft connections, their starting rail device. It is taken from pages 134 to 138 of "Artificial and Natural Flight":

"When fully equipped, my large machine had five long and narrow aeroplanes projecting from each side. Those that are attached to the sides of the main aeroplanes are 27 feet long, thus bringing the total width of the machine up to 104 feet. The machine is also provided with a fore and an aft rudder made on the same general plan as the main aeroplane. When all the aeroplanes are in position, the total lifting surface is brought up to about 6,000 square feet. I have, however, never run the machine with all the planes in position. My late experiments were conducted with the main aeroplane, the fore and aft rudders, and the top and bottom side planes in position, the total area then being 4,000 square feet. With the machine thus equipped, with 600 pounds of water in the tank and boiler and with the naphtha and three men on board, the total weight was a little less than 8,000 pounds. The first run under these conditions was made with a steam pressure of 150 pounds to the square inch, in a dead calm, and all four of the lower wheels remained constantly on the rails, none of the wheels on the outriggers touching the upper track. The second run was made with 240 pounds steam pressure to the square inch. On this occasion the machine seemed to vibrate between the upper and lower tracks. About three of the top wheels were engaged at the same time, the weight on the lower steel rails being practically nil. Preparations were then made for a third run with nearly the full power of the engines. The machine was tied up to a dynamometer, and the engines were started with a pressure of about 200 pounds to the square inch. The gas supply was then gradually turned on, with the throttle valves wide open; the pressure soon increased, and when 310 pounds was reached the dynamometer showed a screw thrust of 2,100 pounds,* but to this must be added the incline of the track, which amounted to about 64 pounds. The actual thrust was, therefore, 2,164 pounds. In order to keep the thrust of the screws as nearly constant as possible, I had placed a small safety valve—¼ inches—in the steam pipe leading to one of the engines. This valve was adjusted in such a manner that it gave a slight puff of steam at each stroke of the engine, with a pressure of 310 pounds to the square inch, and a steady blast at 320 pounds to the square inch. As the valves and steam passages of these engines were made very large, and as the piston speed was not excessive, I believed if the steam pressure was kept constant that the screw thrust would also remain nearly constant, because, as the machine advances and the screws commence to run slightly faster, an additional quantity of steam will be called for and this would be supplied by turning on more gas. When everything was ready, with careful observers stationed on each side of the track, the order was given to let go. The enormous screw thrust started the machine so quickly that it nearly threw the engineers off their feet, and the machine bounded over the track at a great rate. Upon no-



SIDE VIEW OF MAXIM'S AEROPLANE ON THE TRACK READY TO START



THIS PICTURE SHOWS THE TWIN PROPELLERS AT THE REAR OF THE MAIN PLANES. THEIR ENORMOUS SIZE CAN BE READILY APPRECIATED.

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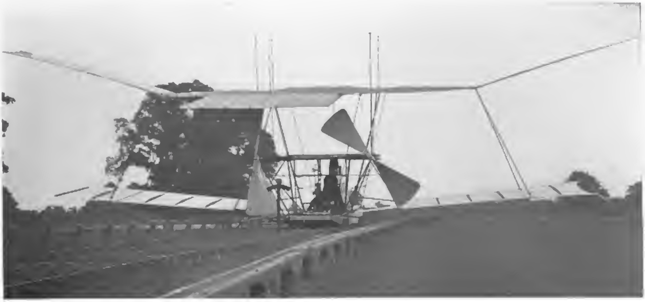
*The quantity of water entering the boiler at this time was so great as to be beyond the range of the feed-water indicator.



THE MAXIM AEROPLANE ON THE TRACK TIED UP TO THE DYNAMOMETER

being a slight diminution in the steam pressure, I turned on more gas, when almost instantly the steam commenced to blow a steady blast from the small safety valve, showing that the pressure was at least 320 pounds in the pipes supplying the engines with steam. Before starting on this run, the wheels that were to engage the upper track were painted and it was the duty of one of my assistants to observe these wheels during the run, while another assistant watched the pressure-gauges and dynagraphs. The first part of the track was up a slight incline, but the machine was lifted clear of the lower rails and all of the top wheels fully engaged on the upper track when about 600 feet had been covered. The speed rapidly increased, and when 900 feet had been covered, one of the rear-axle trees, which were of two-inch steel tubing, doubled up and set the rear end of the machine completely free. The pencils ran completely across the cylinders of the dynagraphs and caught on the underneath end. The rear end of the machine being set free, raised considerably above the track and swayed. At about 1,000 feet, the left forward wheel also got clear of the upper track and shortly afterwards, the right forward wheel tore up about 100 feet of the upper track. Steam was at once shut off and the machine sank directly to the earth, imbedding the wheels in the soft turf without leaving any other marks, showing most conclusively that the machine was completely suspended in the air before it settled to the earth. In this accident, one of the pine timbers forming the upper track went completely through the lower framework of the machine and broke a number of the tubes, but no damage was done to the machinery, except a slight injury to one of the screws.

In my experiments with the small apparatus for ascertaining the power required to perform artificial flight, I found that the most advantageous angle for my aeroplane was 1 in 14, but when I came to make my large machine, I placed my aeroplanes at an angle of 1 in 8 so as to be able to get a greater lifting effect at a moderate speed with a short run. In the experiments which led to the accident above referred to, the total lifting effect upon the machine must have been at least 10,000 pounds. All the wheels which had been previously painted and which engaged the upper track were completely cleaned of their paint and had made an impression on the wood, which clearly indicated that the load which they had been lifting was considerable. Moreover, the strain necessary to double up the axle-trees was fully 1,000 pounds each, without considering the lift on the forward axle-trees which did not give way but broke the upper track."

In the *Cosmopolitan* magazine of October, 1892 (on page 202), Sir Hiram S. Maxim wrote a very lucid description of his aeroplane and in the *Cosmopolitan* of November, 1892 (on page 89), John F. Holland also published a fully illustrated article of his own conception of an aeroplane, which also had superposed planes, rear propellers, and a vertical rudder such as the Wrights now use.

In 1896, Professor Langley flew his steam-driven aeroplane models, which also had two propellers on the rear of the planes, as well as a vertical rudder.

About the same time Pierre Mouillard, of France, is credited with inventing warping wings.

These events all took place many years before the "mysterious" Wright Brothers built an aeroplane that could fly.

LAW AND THE AIR

By Denys P. Myers

Continued from March AIRCRAFT

THE régime of air usage will make necessary the recognition of aircraft in various functions. In a previous article it was pointed out that to follow the analogy of the sea and to suppose the atmosphere as divided into a territorial and "high" air seems to be the most satisfactory legal solution of that problem. This makes the air "free," no state having in it any more rights than are required for its protection. From this point of view, then, it will make considerable difference what sort of machine you travel in, whether it is your own or engaged in public service.

Commonly we do not think of such distinctions, or of what they imply; yet they are of the utmost importance in respect to shipping, and, by analogy, in respect to aircraft. International law now considers ships under five distinct categories, viz: Domestic and foreign private ships belonging to individual citizens, auxiliaries, which, while privately owned, are fitted for conversion to public uses, public vessels devoted to peaceful purposes and public warships. Separate sets of rules and privileges govern the action of each kind of vessel, modified when they are in home ports and more stringent when they are in foreign ports or territorial waters.

These regulations depend upon the right of a state to preserve its entity, and commercial necessity has rendered it obligatory that as much freedom as is consonant with the sovereignty of a state shall be granted all foreign shipping within its jurisdiction. A large number of regulations have been internationally agreed upon, such as the use of the Plimsoll mark to indicate loading capacity, the general signal code, and the sanitary rules, while such matters as clearance and specific port rules are left to a great extent to the individual states.

It is to such a system that aircraft will doubtless have to be assimilated, when they take their place formally in the category of traffic vehicles.

Legal theory as regards aerial jurisdiction is even now widely divergent, but all writers agree on this point. M. Paul Fauchille in a report to the Institute of International Law in 1902 on the juridical régime of aerostats submitted a code which may be quoted at the outset of this discussion, with necessary alterations to include aeroplanes. He says:

"Art. 1.—Aerostats (and aeroplanes) are of two kinds: public and private.

Public aerostats (and aeroplanes), that is to say, engaged in the service of the state, are military or civil. Those are considered as military which are under the command of an officer of the army or navy commissioned by the military authority and provided with a military crew. All balloons (and aeroplanes) in command of a civil functionary of the state and provided with a crew named by the state or its representatives are considered civil. Both kinds bear a flag having the form of a pennant, but at different points determined by Art. 2.

All other aerostats (and aeroplanes) are private.

It matters little for the determination of their character whether balloons are free or captive, that is, attached to the earth by a cable. Their form and the number of individuals composing the crew are likewise without influence."

"Art. 2.—All public or private aerostats should bear constantly attached to the middle of their envelope the national flag. Public, military, and civil aerostats shall bear their respective pennants, the first upon the side of their baskets, and the second upon their envelope, beneath the national flag."

This last article, it can readily be seen, is adaptable to aeroplanes. The provisions regarding the flag are based upon the fundamental necessity that everything that flies, just as everything that floats, must be under the jurisdiction of some state. This can only be indicated by the outward sign of a flag, which, be it noted, will undergo modification for aerial uses.

It is a demonstrated fact that even the best of eyesight is very poor for colors at a distance; and national flags are based on color schemes, generally of little variety. The best unaided eye can distinguish color only at a distance of some thousand yards, but it can distinguish form many times that far. M. Fauchille puts the limit at over 10,000 yards. Moreover, aircraft will move swiftly, a condition unfavorable for observing colors. He accordingly proposes a choice of flags in respect to form. The suggestion appears good, since they would fly against the air and be readily observable, whereas the ordinary flag would be indistinguishable at any height.

This much proposed, we have a method for telling what manner of aircraft is in the air. What duties and privileges will the various kinds have while in territorial air or in respect to landing? The auxiliaries, built so as to be convertible to public uses, need not be separately considered, since they are at any particular time either public or private.

For public and private vessels the flag is the outward and visible sign of its status. In the "high" air and above the soil of its own state, the aircraft, public or private, will be within the jurisdiction of its own state, which is exclusive for all purposes.

Here again enters the difficulty due to diverging theories. According to the idea of a "free" air, no state or property owner will have any right in the atmosphere beyond what is necessary for his preservation and the conservation of his property. In common law this would mean that no genuine law of trespass could exist for an aeronaut, so long as he was flying and did no injury to habitations, crops, or other property. Actual damage, of course, would be actionable, however committed and wherever its origin. But the proposition precludes the setting up of a sign "NO AERIAL TRESPASS" and maintaining the validity of the prohibition in any such sense as one could place upon a similar sign on his lawn and prosecute one who disregarded it.

This statement may sound far-fetched, but it seems to be a fact that actual ownership of the air is impossible. The old dictum about owning the land up to the heavens seems to refer not to *de facto* ownership, but to the right of usage. Two analogous developments in law illustrate the point. One is the doctrine of the *hinterland*, by which Germany acquired its Southwest Africa colony. According to this contention a nation that occupies a foreshore has a preferred claim to all territory inland to where some other state has established or shall establish possession. The sovereignty is inchoate until fixed by occupation, but is nevertheless valid as against any other state. The other doctrine is that of mining law, by which a property owner possesses a vein outcropping on his estate. Only an arrangement with him will allow a miner to work the vein at that apex, but he must be working it himself to prevent an adjacent owner following it through to the apex within his boundaries. Both doctrines arose out of the body of logical law to meet special cases, and, when all is said, the proposition set forth above appears the most just and satisfactory in regard to aerial occupation.

Each state of the Union will probably indulge in legislation to vex the souls of the sky pilots and their case ought to be within the purview of the Interstate Commerce Commission. The demand for federal legislation bearing upon automobile traffic should hasten the day when aircraft also will have certain rights guaranteed to them by the nation. Any such statutes, as relating to private aircraft, will lay down what rules it pleases, but as such laws will doubtless be inspired by interested aeronauts in all cases they will probably be liberal enough to render the air fairly satisfactory as a medium of traffic. Public airships and aeroplanes, to a large extent, will be independent of state laws, being engaged in state business.

When aircraft venture abroad their status as public or private will come more sharply into view. A public machine is by courtesy entitled to ex-territorial treatment. That is, constructively it is considered as a portion of a foreign sovereign state and is therefore regarded as superior to any local or state laws and regulations. At least, such is the practice regarding public ships, and that is the basis adopted here for forecasting the legal control of aircraft. So strict is the law that (Schooner Exchange *vs.* McFadden, 7 Cranch, 116) when Napoleon captured an American vessel, which later returned to its home American waters on public French service, its libel was barred to the original owners because of its status as a public foreign warship.

Private vessels in foreign waters are subject to what jurisdiction pleases the affected state. The French practice is coming into general use. It is, to assume no jurisdiction over foreign merchantmen within her ports save in cases where the act affects some person other than those belonging to the ship, where the local authorities are expressly called upon to interfere, or when the order of the port is disturbed. Aeronauts certainly could not complain if no greater restrictions upon their liberty in foreign aerial territory were enforced. This freedom would come as the result of the theory adopted here, that the air is free like the sea and the nations shall assume only that amount of control over it and its craft as is necessary to protect their own paramount interests.

To be continued in AIRCRAFT *for May*

FOREIGN NEWS

By Albert C. Triaca

THE NEW ENGLISH ARMY DIRIGIBLE, SHOWING THE REMARKABLE SHAPE OF THE PLANES AND RUDDERS.

Argentine Republic

Large crowds always assemble to see Senor E. Bregi make his flights at Bussaco, near Buenos Ayres, on his Voisin machine.

Austria

Herr Wiesenbach made an extended trial with his Wright biplane, flying for 56 minutes, and covering in that time a distance of about 60 kilom. In the afternoon Herr Wachalowski went up on his Henry Farman machine and flew for 15 mins. 20 secs.; while later he flew for 11 mins., this time taking a passenger with him.

Belgium

M. Georges Brichant, a well-known Belgian sportsman, has just founded four prizes of $500 each. The first will be used to provide a cup for a balloon contest, while the others will be awarded by the Belgian Aero Club to the Belgian aviators who fly and carry on an aeroplane the greatest load in a given time.

Canada

Mr. J. A. N. McCurdy has recently been lengthening his flights on the aeroplane Baddeck No. 2, over the ice of Baddeck Bay, Nova Scotia.

Denmark

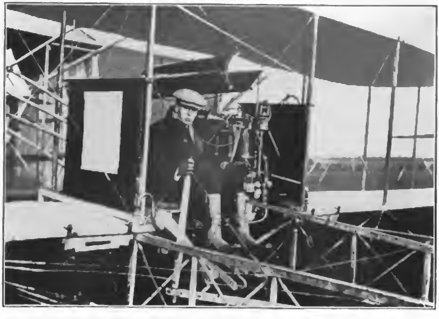
Mr. Johannssen, one of the first Danish aviators, was killed on February 10th in a motor accident near Langon, in the Gironde, while driving to Pau on a friend's car. This car, which was a 120 h.p. racing machine, hit a tree, turned over, caught fire, and burnt poor Johannssen to death.

England

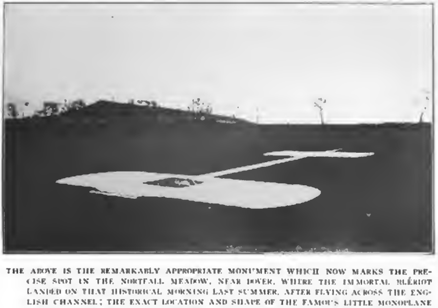
The British army appears at last to have secured a workable airship.

It is 170 feet in length with pointed ends. Fin-like projections are on either side. The framework extends below the body for about three-fourths of its length. The propellers are attached to its sides.

The first British naval airship will be launched in a short time. The crew will consist of officers and men from the warship Vernon, and they are now undergoing a course of instructions. The airship was designed by Mr. Spencer for the purpose of patroling the North Sea. It will be of the rigid type, and will be the largest of its kind in the world except the Zeppelins.



MODERN ELECTIONEERING METHODS AS EXEMPLIFIED BY J. T. C. MOORE-BRABAZON OF ENGLAND.



THE ABOVE IS THE REMARKABLY APPROPRIATE MONUMENT WHICH NOW MARKS THE PRECISE SPOT IN THE NORTFALL MEADOW, NEAR DOVER, WHERE THE IMMORTAL BLÉRIOT LANDED ON THAT HISTORICAL MORNING LAST SUMMER, AFTER FLYING ACROSS THE ENGLISH CHANNEL; THE EXACT LOCATION AND SHAPE OF THE FAMOUS LITTLE MONOPLANE AS IT LAY AFTER LANDING AT SEVEN MINUTES PAST FIVE JULY 25TH, WERE EASILY DETERMINED BY THE DOWN-TRODDEN GRASS AND WORN-OFF PATCHES MADE BY THE EAGER CROWDS DRAWN TO THE SPOT THAT DAY.

THERE IS A QUESTION OF ERECTING A MONUMENT ON THE SPOT ON THE FRENCH COAST FROM WHICH THE BLÉRIOT ROSE, THIRTY-SEVEN MINUTES BEFORE IT ALIGHTED ON THE ENGLISH TURF.

IN STRANGE CONTRAST TO THIS SPIRIT OF COMMEMORATING GREAT AERONAUTIC ACHIEVEMENTS, WAS THE DECISION OF THE PARISIAN MUNICIPAL AUTHORITIES NOT TO ALLOW THE ERECTION OF A MEMORIAL STONE AT BAGATELLE OPPOSITE THE SPOT WHERE SANTOS-DUMONT'S LITTLE FLYER LIFTED HIM IN THE AIR ON AUGUST 22D, 1906.

Many automobiles were used prior to the recent Parliamentary elections, spreading electoral literature and placarded with electoral posters.

Mr. Moore-Brabazon, the eclectic English sportsman, used his biplane for the same purpose. On the radiators, on either side of him, appeared the slogan, "Any peer is better than Napier, so we'll err if we don't vote for Wheeler."

This is the aeroplane which last winter won the large prize offered for the first mile flight of a British-built aeroplane by a British subject. It is also the machine on which Mr. Moore-Brabazon facetiously took up as a passenger a small pig, with the label, "I am the first pig to fly," thereby holding myriads of his countrymen to their agreements to do certain things "when the little pigs begin to fly," the equivalent of the American "when the hens have teeth."

The first flight ever made in Ireland is to the credit of H. G. Ferguson, of Belfast, who recently succeeded in flying on a monoplane built by himself, in Lord Downshire's Park, at Lisburn.

The number of flying machines at present being built in England is variously estimated at between five hundred and one thousand.

At the time of the recent elections, the Aerial League of the United Kingdom seized the occasion to send out a letter to all candidates for Parliament, asking them their opinions on aerial defense, and further asking whether they were prepared, if elected, to vote an adequate aerial navy for Great Britain, for, as a matter of fact, people who have really studied the question are more than a little upset at the enormous lead which Germany has obtained in forming her air-fleet. As a result of these letters 316 Parliamentary candidates replied that they were favorable to the formation of an adequate aerial fleet, nine replied that they were doubtful about it, and four said they did not believe in it at all.

England will be to the fore next summer in aviation. Already four flying weeks are in preparation. Two of them will be international, with $40,000 in prize money at each.

At all four it is hoped there will be a worthy representation of English aviators, among whom may now be mentioned—as practical flying men—J. T. C. Moore-Brabazon (winner of the Daily Mail

$5,000 prize for the mile flight); Hon. C. S. Rolls, Mortimer Singer, Claude Graham-White and S. F. Cody. The localities and dates of the meetings are appended: Bournemouth, July 11th to 16th; Southport, August 6th to 11th; Edinburgh, in June; Wolverhampton, date not fixed.

Bournemouth and Southport will be the two international fixtures.

London is looking with some curiosity at the first British aeroplane price list, which has just been issued.

France

The French War Office decided that the Signal Corps will direct the new aerial department known as the "Service Aéronautique."

Professor d'Arntouial at the École Supérieure d'Aeronautique has made the statement that pure hydrogen can be obtained from coal-gas by lowering its temperature to the point of liquefaction; evaporation can be used instead of heat to change the liquid hydrogen into gas.

The Technical Committee of Aerial Locomotion has decided on the suggestions of Commandant Bouttieaux to turn over to the War Office the plans of the dirigible of the rigid type, which Mr. Spies has offered to the Government, and which will be the longest air-cruiser ever built in France. Two motors of 120 h.p. each will drive its two pairs of large diameter wooden propellers.

At Alpreck, near Boulogne-Sur-Mer, Captain Sacouney recently made a remarkable man-lifting kite experiment, using only five large kites, connected in the usual way. He made an ascension with Madame Sacouney.

THE OFFICIAL POSTER OF THE HELIOPOLIS AVIATION MEET. WHAT ARE THE IMPRESSIONS OF THE BEDOUIN, MASTER OF THE DESERT, OBSERVING THE KINGS OF THE AIR?

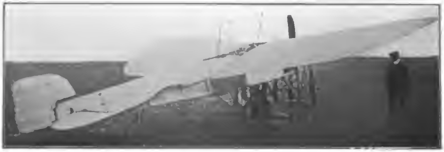
Henry Farman has been wonderfully successful with his new aeroplane, which is a biplane with some points usually associated with monoplane construction. In his first trial he carried two passengers for sixteen minutes at nearly fifty miles an hour; this was followed up by a flight of sixty-two minutes under similar conditions on March 5th. This is the first three-man flight ever made exceeding an hour in duration.

Mr. Sommer, one of the first pupils of Henry Farman, and now a manufacturer of aeroplanes, carried up a "useful load" of 210 kilograms recently; he will continue his experiments in weight carrying.

Lazare-Weiller has presented the Wright machine with which Wilbur Wright made his notable flights at Le Mans to the Ministry of War. The aeroplane has flown almost 4,000 miles.

Santos-Dumont's record for lightweight aeroplane building has been surpassed by a French constructor, M. Vendôme, who has invented a monoplane that weighs only 100 pounds. Santos-Dumont's machine is 37 pounds heavier.

Blériot believes he will be able to fly 70 miles an hour in his new monoplane. Sommer's new biplane is the lightest machine, size considered, yet built. Ready for flight, it weighs 720 pounds, and has a spread of 45 square yards of wing surface.



THE 1910 BLÉRIOT

KNOWN ALSO AS THE BLÉRIOT XI BIS, IS SIXTEEN INCHES SHORTER THAN THE "CHANNEL" TYPE; ITS FUSELAGE OR MAIN BODY IS ENTIRELY COVERED OVER WTH CLOTH; THE SHAPE AND SURFACE OF THE RUDDERS ARE QUITE DIFFERENT AND THE FIXED PORTION OF THE TAIL STARTS FROM THE OUTSIDE OF THE HORIZONTAL RUDDERS AND TAPERS TO THE MAIN PLANES.

Egypt

THE HELIOPOLIS MEET

The first great concourse of aviators of 1910 took place in Southern California, which one of the newest civilizations in the world is turning into the earth's garden spot: the second took place in Egypt, where the gigantic mementoes of one of the most ancient of civilizations afforded a weird background to the evolutions of the latest creations of man's genius.

In but one thing did the two "aviation weeks" present an analogy: the climate of the sites chosen for them, for Egypt and Southern California are precisely similar in this, and no other country entirely shares the similarity.

Those who triumphed in the dry, bracing air of the land of the Pharaohs were Rougier and Métrot on Voisin biplanes, Le Blon and Balsan on racing Blériots.

Those who graduated from the fledgling class and gave promise of becoming great flyers were Hans Grade, the German inventor who drove his remarkable little monoplane (a cross between a Santos-Dumont "Demoiselle" and a Blériot of the "Channel" type) with unerring skill; Riemsdyck, who piloted the Herring-Curtiss biplane he came over here to get last winter; Duray, who promises to be as great an aviator as he was a racing motor driver; Sands, an American pupil of Latham; Hauvette-Michelin, another Antoinette man, and the Baroness Raymonde de Laroche, who showed the gaping thousands that aviation is not destined to be solely a man's game.

Madame de Laroche made a continuous flight of over twelve miles in her Voisin, thereby securing the title and license of aviation-pilot of the Aero Club of France.

The only unlucky one was the great Latham, of whom so much had been expected and who smashed two of his machines.

Great crowds turned out every day to cheer the flyers: a picturesque array of Cairoans: Copts, Syrians, Arabs, Bedouins, Sudanese, on the one hand, and on the other the ultra-fashionable gathering of Europeans and Americans who come to Cairo at this season, and who motored or drove out to the aerodrome in great numbers, from the Cairo hotels and the more distant Ghezireh Palace and Mena House.

The only serious accident occurred some days before the meet, when Mortimer Singer, the well-known English sportsman, was overturned by a gust when flying near the ground and sustained a broken leg in the fall.

A propos of the Heliopolis meet, a contemporary wrote "it was of course the first flying ever seen in Egypt"; one feels inclined to echo: "of course," but it only goes to show that in aviation news probability should never be taken for certainty, and Aircraft for one will never do so.

The first flying seen in Egypt was last December, when the Belgian sportsman, Baron Pierre de Caters, made some remarkable flights over the desert in his Voisin.

Below is a summary of results of the Heliopolis meet:

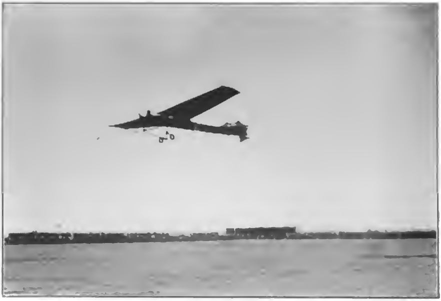
Grand Prize of Egypt for total distance in week: 1 Rougier (Voisin), 95½ miles, $5,000; 2 Le Blon (Blériot), 88¾ miles, $2,000; 3 Balsan (Blériot), 86¾ miles, $1,000; 4 Métrot (Voisin), 86 miles.

Heliopolis Prize for height: 1 Rougier (Voisin), 836 feet, $10,000; Rougier (Voisin), 719 feet; Rougier (Voisin), 633 feet; 2 Latham (Antoinette), 170 feet.

Baron Empain Prize for greatest distance in continuous flight: 1 Métrot (Voisin), 53¾ miles, $10,000; 2 Rougier (Voisin) 40½ miles, $2,000; 3 Le Blon (Blériot), 31½ miles, $1,000; 4 Balsan (Blériot), 27½ miles, $500.

Speed Prize on ten kilometers: 1 Le Blon (Blériot), 8′ 7″ 4·5; 2 Rougier (Voisin), 9′ 30″; 3 Balsan (Blériot), 9′ 50″ 2·5; 4 Grade (Grade), 11′ 6″.

On five kilometers: 1 Balsan (Blériot), 4′ 1″; 2 Le Blon (Blériot) 4′ 2″ 3·5; 3 Duray (Farman), 4′ 12″ 4·5; 4 Sands (Antoinette), 4′ 22″.



FLYING ABOVE THE SANDS OF EGYPT: AN ANTOINETTE IN ACTION AT HELIOPOLIS

LATHAM'S ACCIDENT IN EGYPT. THE "CHILDREN OF THE DESERT" GAZING AT THE WRECK.

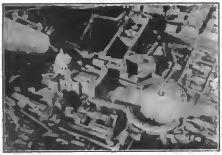
Italy

The Italian dirigible "Leonardo da Vinci" recently made several flights around the Cathedral of Milan, its crew were, no doubt, jealous of the evolutions made by the military dirigible "I Bis" around St. Peter's. The Leonardo da Vinci subsequently met with an accident, which, however, entailed no injury to the aeronauts.

The committee in charge of organizing the great aviation meet near Milan in September has decided to devote $60,000 to the prizes; $10,000 of this sum is offered by the municipality of Milan.

Among the aeroplanes now quartered at the Aérodrome of Bovolenta, near Padua (which is under, the auspices of H.R.H. the Prince of Udine) are one Voisin biplane, two Santos-Dumont "Dragon Flies" and three Blériots.

The well-known Sicilian sportsman, Vincenzo Florio, intends organizing aviation trials during the annual Targa Florio Auto Race Meet at Palermo.



EVEN SAINT PETER'S OF ROME LOOKS SMALL TO THE MODERN SKY-PILOT. WHAT WOULD MICHAEL-ANGELO SAY TO THIS SNAPSHOT FROM THE ITALIAN AERIAL WARSHIP, PART OF THE BOAT-SHAPED CAR OF WHICH IS VISIBLE IN THE UPPER LEFT CORNER? FROM HIS SELF-MADE EXILE, THE VATICAN GARDENS, HIS HOLINESS THE POPE GAZED ON THE GREAT APPARITION, JUST AS HE HAD WATCHED A YEAR AGO WILBUR WRIGHT SOARING OVER THE CAMPAGNA IN THE DISTANCE.

From Turin comes the news that at last the new Faccioli biplane was tried with great success on the aerodrome of La Veneria, near Turin. Several short flights were made, the machine being piloted by the son of the inventor. The trials were witnessed by the young Prince of Udine, King Victor's cousin, and he begged to be taken for a trip, but the inventor declined the responsibility.

An aviation school will soon be opened in Milan by Mr. Jacchia.

Germany

The Germans are considering the problem of how aeronauts are to determine their location at night or in a fog. Dr. Bidlingmaier of the imperial observatory at Wilhelmshaven has proposed a very simple adjunct for the equipment of the aeronaut which will enable him to locate his position with some measure of accuracy without the use of eye or ear as dependent upon terrestrial signals. The instrument in question is to be called "duplex compass."

Emperor William of Germany has confided to Count Zeppelin that he will never experience the sensation of flying. Following the example set by Alphonso XIII, when he made a similar pledge to Queen Victoria of Spain, he has promised the Empress that he will make no ascent, either in a dirigible or an aeroplane. His Majesty added that the Empress regarded all air-craft as dangerous.

The Deutscher Luftschiffer Verband has decided to furnish every aerostat, dirigible, or heavier-than-air apparatus with a log-book containing all the information about their construction and power.

The dirigible of Professor Shutte of Danzig, is being built at Reinau; the huge gas-container will be 138 meters long and 17 meters in diameter. Like the Zeppelin, it will contain a number of small balloons, but whereas the Zeppelins have sixteen or seventeen such balloons, the Shutte is to have eleven.

The Clouth dirigible has recently had several successful trials near Cologne.

The Zeppelin North Polar Exploration Committee met here to-day under the presidency of Prince Henry of Prussia. Count Zeppelin, Professor Hergesell and Professor Lewald were among those present. The committee discussed the programme of the summer's work, which will be devoted to a preliminary expedition for the purpose of studying ice conditions. The Government will be asked for the use of the exploring vessel Poseidon for about two months.

The expedition will start for Spitzbergen July 1st on an excursion steamer, and there will transfer to the Poseidon. A Norwegian ice steamer will be used for the purpose of forcing an entrance into the polar ice, and the expedition will return at the end of August. Apparently no airship will be taken for summer use.

Hungary

The Hungarian Automobile Club is planning for a long-distance flight competition this summer, under the auspices of its aviation section.

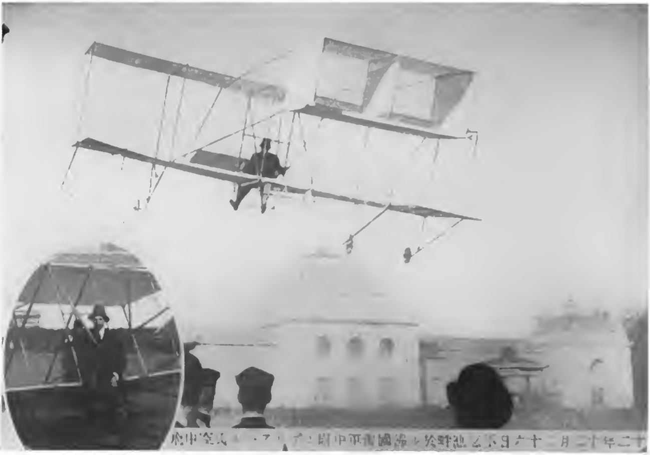
The municipality of Budapest has given $40,000 to the committee in charge of the Budapest Aviation Meet, June 5th to 15th.

Greece

The aeronautical education of the Greeks is apparently still to be made. When the Belgian aviator, Baron de Caters, arrived at Athens recently on his way home from Egypt, with the idea of showing the Hellenes the road to the sky, he received so little encouragement and such poor ac-

ROUGIER FLYING AT HELIOPOLIS

IT SO HAPPENED THAT ON SEVERAL DAYS OF "AVIATION WEEK" THE USUAL CERULEAN SERENITY OF THE SKY OF LOWER EGYPT WAS DISTURBED BY THE "SIMOUN"; ONLY THE MORE INTREPID AVIATORS DARED TO FACE THE HOT SAND-LADEN GUSTS OF THE DESERT-WIND.



GLIDING IN JAPAN: THE FIRST HEAVIER-THAN-AIR MACHINE TO SOAR IN THE LAND OF THE RISING SUN.

THE JAPANESE INSCRIPTION BENEATH THE PICTURE READS AS FOLLOWS:

"SNAPSHOT OF THE FLIGHT OF THE FRENCH NAVAL OFFICER LE PRIEUR NEAR THE SHINOBADZU POND, THE 26TH DAY OF THE 12TH MONTH OF THE 42D YEAR OF THE MEJI."

IN THE CORNER: M. LE PRIEUR POSING FOR THE ORIENTAL CAMERA-FIENDS

commodations all around that he gave up the idea and sailed from Piraeus with his unappreciated Voisin.

And this is the land of Daedalus and Icarus; but a few months will change this apathy for enthusiasm, as it has everywhere else.

Japan

Near Shinobazzu, a French naval officer made two successful flights some weeks ago with a glider of the Voisin type. He was assisted by two members of the Aviation Committee of Tokio. Watch the Japs when once they get started.

Monaco

Since his return from Egypt Rougier has been on the Riviera. He recently made several sensational flights about Monte Carlo, at one time flying a couple of miles out to sea.

At the Motorboat Meet of Monaco (1st to 14th of April) we will find the hydroplane Ricochet XXII, the famous gliding boat, the Brasier Despujols; the Duc II, a semi-hydroplane, and others.

Norway

An Aero Club has been formed at Christiania. It is to become affiliated to the International Aeronautique Federation. M. H. Mohn, the meteorologist, was elected President.

Russia

It recently came to light that Grand Duke Alexander, of Russia, has been visiting Paris for the purpose of studying the various kinds of aeroplanes made in France for their suitability for military purposes. He was instructed to purchase a large number of them for the Russian army.

Servia

Belgrade will have this month a series of exhibition flights by M. Bleriot, who seems to have a predilection for flying in the Balkan States, having already soared in the air of Roumania and Turkey.

Spain

An aeronautical exhibition is being organized by the Asociacion de Locomocion Aerea at Barcelona.

Dr. Gans-Fabrice has announced that he has completed his plans for his adventurous attempt to cross the Atlantic Ocean in an airship, and that he will start on the trip in the middle of May. The starting point has not yet been chosen, but it will be either on the coast of Portugal or the Island of Teneriffe.

The balloon is elliptical in shape, 162 ft. long and 40 ft. broad, and contains 6,000 cubic meters of hydrogen. The car takes the form of a gondola, is shaped like a submarine boat, and is 28 ft. long, 7 ft. broad and fitted with a 4 h.p. motor.

This engine will only be used to keep the balloon in the course of the African trade winds, the aeronaut's idea being to make the voyage entirely without mechanical propulsion by keeping within the air currents which took Christopher Columbus on his voyage of discovery.

To obviate all danger that might arise from the expansion of the gas under the influence of changes of temperature the balloon has two envelopes, between which an air current constantly circulates.

Switzerland

San Moritz, the well-known winter resort of European fashion, has received the visit of Captain von Engelhardt, the German officer instructed by Orville Wright in the past autumn, and of Santos-Dumont; they have of course brought their flyers with them, and the former has already made some flights.

FOREIGN CLUB NEWS

Great Britain will probably be represented in the coming Gordon Bennett Aviation Race by J. T. Moore-Brabazon, Mortimer F. Singer and John Dunville.

Lord Charles Stuart Rolls, one of the best known aeronauts in the world, will be the English champion in the Gordon Bennett Balloon Cup.

His Majesty King Edward, recognizing the good work done by the Aero Club of the United Kingdom, has granted to the Club, as a mark of appreciation, the right to use the prefix: Royal, and accorded his patronage to the Olympia Flight Exhibition.

A flying machine model club has been formed in London, the first in England.

The Aviation Section of the English Motor Union has decided not to restrict itself to heavier-than-air machine.

Several hundred women are now enrolled on the English Women's Aerial League.

The Societa Aeronautica Italiana has named as its representatives Nino Piccoli and Albert C. Triaca for the Gordon Bennett Balloon Race, and Albert C. Triaca for the Gordon Bennett Aviation Race.

The Dirigible Committee of the Aero Club of France is studying the possibility of receiving by wireless information concerning barometric pressures on different points of the Atlantic Coast.

THE TRI-LOBATED SPANISH DIRIGIBLE TORRÈS QUÉVADO, WHICH IS NOW AT SARTROUVILLE, FRANCE.

BOOKS

L'Aviation. . . This is a volume by Commandant Paul Renard, brother of the famous Colonel Renard. It contains his six lectures on aviation made in 1909 at the "Société d'Encouragement pour l'Industrie Nationale." Le Navire Aérien. Mr. L. Marchis, the author, who was nominated to the aviation chair at the Sorbonne in Paris, has here brought together, in a substantial volume, his lessons in aerostatics and aviation. This book, which is in itself, a very complete review of aerial navigation in both the theoretical and practical field, will be a genuine help to manufacturers, scientists and inventors.

MISCELLANEOUS

Shortly after the "République" disaster, the Temps opened a public subscription, with a view to replacing the airship. Altogether 312,000 francs were contributed, and 40,000 francs were spent in providing for the widows of the two adjutants. A committee asked the various principal constructors to name the lowest price at which they would supply their dirigibles or aeroplanes. In consequence of their patriotic action in giving very low prices, it has been possible to order two dirigibles and four aeroplanes, which with the dirigible which Messrs. Lebaudy are presenting to replace the ill-fated "République," will give the French Government a very imposing aerial fleet. The largest dirigible, of 7,000 to 8,000 cubic meters, will be built by the Astra Company, while the other airship will be a Zodiac of 1,400 cubic meters.

The aeroplanes will be of the Henry Farman, Maurice Farman, Blériot and Wright types.

To what are English inventors turning their minds to-day? The records at the Patent Office show that the branches of invention which received the most increased attention during 1909 were aeronautics, motors for road vehicles and advertising schemes.

A few years ago the individual who entered the Patent Office with an application relating to a flying machine ran the risk of being regarded as a harmless lunatic. It is yet too early for any exact classification to be available of the various applications made during the past year, but the index for the first three quarters shows that close upon a thousand inventions relating to aeronautics were brought to the notice of the authorities during the twelve months.

An action has just been fought in Paris in which the Voisin Frères sued M. A. Clément for an infringement of their patent controlling gear, by which the whole control is effected by one organ (lever or wheel). M. Clément cited an old patent of Penaud and Gauchot of 1876, but the court held that it was not a valid patent, as it had never been worked. However, the court also held that the Voisin system was open to inspection by anybody on the machine built for Henry Farman prior to the date of the patent, April 10, 1908. Consequently this was held to be anterior publication, and the verdict was given, with costs, in favor of M. Clément.

Mr. Capazza, Vice-President of the Société Française de la Navigation Aérienne, and a pioneer in aeronautics, recently said to a newspaper man: "I certainly admire scientists such as Gabriel Voisin, Blériot, the Wrights, Tatin, the Farmans, Santos-Dumont, who are following out their theories with practical work, but I have little use for the armchair experts who loudly prophesy that aeroplanes will this year be flying at two hundred miles an hour on the strength of their precious formulas and calculations."

Seen in an English magazine:

Lost An Aeroplane

Sir: I wish to inform the readers of your magazine that I lost a self-propelled aero model. Any reasonable expenses will be paid to finder of the same.

We will repeat the "Ad" in Aircraft without charge, on the chance the roaming flyer has drifted into this hemisphere.

ON ITS RECENT TRIP FROM BRACCIANO TO NAPLES AND RETURN, THE ITALIAN WAR DIRIGIBLE NO. 1 BIS MAINTAINED AN AVERAGE SPEED, OVER THE 325 MILES, OF OVER TWENTY MILES AN HOUR; WITH THE WIND, THE SPEED TOUCHED FIFTY-FOUR MILES AT TIMES; WHILE AGAINST IT, IT OCCASIONALLY FELL AS LOW AS ELEVEN. THE DIRIGIBLE IS HERE SEEN ON ITS COURSE.

BIG MEN OF THE MOVEMENT

JAMES GORDON BENNETT

JAMES GORDON BENNETT was born in New York, May 1, 1841. It would be hard to say whether he is better known by his position in the newspaper world as the proprietor of the New York Herald or by his untiring efforts to promote international competition in every kind of sport.

It would seem as if the mere name of Gordon Bennett Cup implied of itself the blue ribbon of the particular sport referred to.

For many years the Gordon Bennett Cup was the annual international automobile race par excellence, the race for which months in time and thousands of dollars in money were spent in preparation. Then motorboating received its share of attention from Mr. Bennett, and finally he turned his attention to air-craft.

When the International Aeronautic Federation was organized in 1906, Mr. Bennett presented it, for annual competition, with the handsome silver Gordon Bennett International Balloon Trophy which has since been so hard fought for by the most skilful pilots in the world. For the first three years Mr. Bennett gave with the trophy each year the sum of $2,500 in cash, and as a result the sport progressed rapidly.

It was first held in Paris, and won by Lieutenant Lahm, the sole representative of the donor's country; held at St. Louis in 1907, the Cup recrossed the Atlantic, being won by Germany; Switzerland then came to the fore—in 1908—and now once more America has "lifted" the famous "Coupe Internationale."

When the heavier-than-air machine had been developed to the stage where several aviators had succeeded in actually flying, Mr. Bennett donated another trophy to the International Aeronautic Federation, this time for annual competition by heavier-than-air machines, and to this magnificent trophy $15,000 in cash were added, $5,000 to go each year to the winner of the trophy. In each case the trophy becomes the property of the Club represented by the winning pilot until the next competition takes place. As all the world knows both prizes were won last year by Americans, and thus both will be fought out in this country during 1910, under the auspices of the Aero Club of America.

Is it necessary to mention Mr. Bennett's further claims to the gratitude of his countrymen? Whoever has read the story of the cruise of the "Jeannette" will have realized in what esteem and admiration the members of that famous expedition held its organizer.

The first land that Commander de Long trod in two years was a hitherto unknown island lost in the arctic wilderness of ice, north of Siberia. After effecting a landing on it he did two things: one was to raise the Stars and Stripes and the other to name the new land Bennett Island.

Another famous expedition promoted by James Gordon Bennett was Stanley's famous search for Livingstone "through darkest Africa."

Mr. Bennett was also instrumental in establishing a new line of transatlantic cable.

HENRY DEUTSCH
(DE LA MEURTHE)

IT would be impossible to give the very briefest sort of a biography of Mr. Henry Deutsch in these few lines, as his work in the promotion of aerial flight is very extensive, so that what we are offering herewith are but a few impressions of this intelligent business man and courteous sportsman.

Henry Deutsch (de la Meurthe) was born in Paris on September 26, 1864, and at the present time he is associated with his brother as the head of the firm of "The Sons of A. Deutsch."

Mr. Deutsch is best known in the world of science and sport for his generous encouragement toward the advancement of both automobiles and air-craft, although he also enjoys the distinction of being a patron of art and artists.

He was one of the founders of the Automobile Club of France, and also of the Aero Club of France, and he has not only devoted large sums of money towards the encouragement of aeronautics, but he personally takes an active part in demonstrations of aerial flight as well. He conceived the idea of using motors in air-craft even before they were used in automobiles, and during the early stages of the automobile industry he made suggestions along this line in an address delivered at the Paris Exposition of 1900. A few months afterwards he founded the famous Deutsch prize, offering one hundred thousand francs to the aeronaut who would make a voyage in the air from the ground of the Aero Club of France at St. Cloud and, traveling around the Eiffel Tower, arrive back at the starting point within half an hour. This prize was won by Santos-Dumont, October 17, 1900.

A little later, together with Mr. Ernest Archdeacon, he founded another prize of fifty thousand francs to be awarded to the aviator who would fly in a heavier-than-air machine within a closed circuit of at least one kilometer, without touching the ground. This prize was won by Henry Farman in a Voisin aeroplane on January 13, 1908, at Issy les Moulineaux (France).

Mr. Deutsch also expended nearly two hundred thousand dollars in building, altering and experimenting with his large dirigible, "La Ville de Paris," which later he generously offered to the French Government when the ill-fated war dirigible "Patrie" was lost near Verdun.

Realizing that the rapid development of aerial locomotion required specially trained men with both theoretical and practical knowledge in the construction and operation of the different kinds of air-craft, he took the first steps toward the foundation of an Institute of Aeronautics in St. Cyr-L'Ecole, France, giving the sum of one hundred thousand dollars to begin with, and an allowance yearly of three thousand dollars.

This Institute will be opened for business May first, with several complete departments directed by the most competent men in France.

The generosity of Mr. Henry Deutsch (de la Meurthe) was one of the main factors tending toward the remarkable progress made in aeronautics in France during the past few years.

COLGATE HOYT

COLGATE HOYT, a man of prominence in every field of endeavor in which he has devoted his energies, a patron of progress, in every sense of the expression, was born in Cleveland sixty-one years ago.

The son of Hon. James M. Hoyt, an eminent practitioner at the bar, Mr. Hoyt may have thought of following in his father's footsteps and duplicating his legal fame, but an eye-injury compelled him to abandon the course he had begun at Phillips Academy, Andover, Mass. He returned home and entered upon a business career in the hardware store of Colwells & Hingham, of Cleveland.

He became later a partner of his father in buying and selling real estate, and has continued to this day to have substantial real estate interests and holdings in Cleveland.

Removing to New York in 1881, he became a partner in the staunch Wall Street firm of James B. Colgate & Co.

In 1882 President Arthur appointed him Government director of the Union Pacific Railway, and in 1884, backed by a large stock interest, he was elected a regular director.

After several years he and his colleagues transferred their interests to the Northern Pacific Railroad, and Mr. Hoyt was elected a member of the Executive and Financial Committees of the Board of Directors of that road, and Vice-President of some of its principal branch lines. In 1884 he became actively identified with the Wisconsin Central Railroad, and pushed the continuation of this line west to St. Paul and south to Chicago, at which latter point he helped organize and finance the Chicago & Northern Pacific Railway, owning large terminals in the center of the city. In 1886 he became Vice-President of the Oregon & Transcontinental Company. Organized and financed the noted Spanish-American Iron Mines of Cuba, now a part of the Pennsylvania Steel Co.'s properties. In 1889 became identified with the Missouri, Kansas & Texas Railway Company, and for twenty years served on the board and as Vice-President.

Mr. Hoyt's name is a familiar one to all those interested in the newer forms of locomotion.

There is little need to dwell on his position in the automobile world; his administration as President of the Automobile Club of America, the representative national body of motordom, comes instantly to mind. It was during this administration that the A. C. A.'s beautiful club house in New York was financed and built.

Mr. Colgate Hoyt is only one more of the many prominent and conservative men in the country turning their beneficent interest in the direction of aeronautics.

An early member and enthusiastic supporter of the Aero Club of America, Mr. Hoyt is keenly alive to the startling possibilities of air-navigation.

The Aero Club has already numbered him among its officers, and it is on just such men as he that it counts to spread its doctrine of progress and to give the country the position it should occupy in aerial matters—the first.

BIG MEN OF THE MOVEMENT

J. C. McCOY

J. C. McCOY of New York: here is another eminent sportsman, a man of prominence, wealth and high social standing who has taken up aeronautics from both sporting and scientific standpoints.

In business Mr. McCoy is a banker, being President of the Perth Amboy Trust Company of that city, as well as a director in several other banking institutions in New York and Providence, R. I.

Aeronautically Mr. McCoy enjoys an international reputation, being known wherever ballooning as a sport is indulged in.

Thousands of men are nowadays interested in aeronautics, and hundreds are actively going in for it and "getting off the ground," but such was not the case only a very short while ago.

In ballooning as a gentleman's pastime, Mr. McCoy may be said to be something of a pioneer.

"One" is the number of his license as an Aero Club pilot, he being the first man to qualify as such.

In the second holding for the Gordon Bennett Cup balloon race, that of St. Louis in 1907, he finished fourth, with a distance of 736 miles. He was forty hours in the air, and beat all records for pilots of the Aero Club of America for distance and duration.

He again had the distinction of representing his country in the following race for the Cup, that held at Berlin in 1908.

This year fog spoilt Mr. McCoy's chances of finishing "in the money." Last year Mr. McCoy did not take part in the Gordon Bennett Cup Race; he was nevertheless indirectly responsible for his country and club's victory in the event.

None of the usual Aero Club pilots were able to go to Switzerland to represent the Club, but Mr. Mix, an American and Club member residing in Paris, undertook, at Mr. Cortlandt Field Bishop's suggestion, to carry the American colors at Zurich, if that very necessary adjunct—a balloon were available for the purpose.

It is here that Mr. J. C. McCoy stepped in and offered to the Club the use of his full-sized racing balloon, the ultimate victor in the race, "America II."

It is just such acts of sportsmanship and disinterestedness as this which make the Aero Club proud of its governing board.

Being one of the founders of the Aero Club of America, Mr. McCoy has been repeatedly elected director of that organization from its very inception.

During 1907 and 1908 he acted as First Vice-President, and in the fall of the latter year was elected President of the Club, serving in that capacity until January, 1909, when he resigned in order to go around the world.

Mr. McCoy, who is a great devotee of traveling, is at present engaged on a second circuit of the planet; let it be hoped for the still greater enjoyment of the trip, that his third "circular" voyage will be accomplished without the aid of either railway or steamboat, or any other mere land or water vehicle!

A. LEO STEVENS

A. LEO STEVENS, America's foremost balloonist, was born in Cleveland in 1873. It was scarcely twelve years later that he made his first ascension, and by the time he was fourteen he had achieved sufficient fame to be known far and wide as the Boy Aeronaut.

Stevens was just fifteen years of age when he built his first balloon; at eighteen his career came near to being suddenly and dramatically ended; he "landed" in Lake Erie, and was not rescued until the following day, having spent the entire night in the frigid waters of the great inland sea.

When little more than a lad he became proficient as a parachute-jumper, and when still in his teens an air-trip from the shores of Lake Ontario to South Carolina added a further stock to his accumulated laurels; this was at the time one of the longest balloon voyages ever made.

It was in 1893 that he started manufacturing balloons in New York. Eight years later he built the first dirigible to float in American air and stem an American breeze; his engine was a De Dion-Bouton, imported from Paris, and with the exception of Santos-Dumont's, the only one used on an air-craft at that time. Certainly only light breezes could be successfully coped with by this early type of airship, but as a pioneer it has its place in the history of American aeronautics.

In the middle of the last century ballooning had many adepts in this country, chief among whom was the immortal Wise, but for many years the sport had more or less fallen in disrepute.

Among the men to whom a debt of gratitude is due for re-establishing the art of ballooning and placing it before the world as one of the grandest and safest of sports and pastimes perhaps none is more deserving of it than Leo Stevens.

An early member of the Aero Club of America, he did much to promote the sport, and when the Count de la Vaulx—the holder of the world's distance record—and Charles Lévée, came over from Paris, Stevens was closely associated with them in their endeavors to encourage American ballooning.

Ballooning had long been looked upon as a dangerous sport, but when Mrs. C. J. S. Miller of Franklin, Pa., rose in Stevens' basket on August 11, 1906, that era may be said to have been ended; since then an appreciable minority of Stevens' passengers has belonged to the fair sex.

Besides being a member and pilot of the Aero Club of America, the Aeronautic Society, the Aero Clubs of Ohio, Pittsfield, of North Adams and of New England count Stevens among their members, and he is honorary member of the Columbia University Aero Club.

Three years ago he was appointed instructor in the United States Balloon Corps, and trained the Signal Corps in the handling and care of aerostats.

The International Race at St. Louis was run under his guidance, and those connected with ballooning will appreciate his ability in this direction, when it is said that the great gas-bags soared aloft at their allotted time, with the regularity and punctuality of trains leaving a terminal station.

COUNT VON ZEPPELIN

COUNT FERDINAND VON ZEPPELIN, the designer of the greatest and in some respects the most remarkable and most successful aircraft ever built, was born July 7, 1838, at Constance, on the shores of the lake, over which his genius was, half a century later, to reveal itself to an astonished world. Count von Zeppelin has probably devoted more time to the study of aeronautical problems than any man living; in fact, they may be said to have occupied the major portion of his already long life.

It was only after these years of patient study that von Zeppelin, then a general in the German Army and adjutant to the King of Wurtemburg, after deciding on the lighter-than-air type, conceived the idea of constructing a large and rigid airship which should preserve its shape under all conditions.

This idea was not favorably received by the Prussian Ministry of War, and the Count accordingly organized a company to build the largest of all airships. A site was given by the King of Wurtemburg, at Manzell, on the shore of Lake Constance, and in 1898, a great floating shed was anchored off the shore; it was secured at its front end, which thus always faced the wind. In the shed a strong aluminum frame, having 16 sides, but of generally cylindrical appearance, 420 feet long, and 39 feet in diameter, with bomb-shaped ends, was put together. The interior was divided in 17 compartments, each holding an ordinary balloon; they had a combined volume of 390,000 cubic feet. The metal frame was covered with cloth, and this mode of construction was followed out in all the latter Zeppelins. In fact, so remarkably did practice confirm the earnestly thought-out theories of the great inventor, that except in motor power, the present Zeppelins differ but in detail from the first one. The latter had the separate compartments, four propellers and two engines which have afforded ever since such a high guarantee of safety to this type of airship whenever it is in its element. The first engines used were two 16 h.p. Daimlers; those destined for the latest Zeppelins are expected to furnish them with 500 h.p. and propel them at 40 miles an hour.

It is not too much to say that the most marvellous air-voyages ever made by any type of aerial machines are to the credit of Zeppelin's great craft. It would be beyond the scope of a succinct biography to relate the many journeys the giant ships have made over Germany and Switzerland. Suffice it to say that they hold all records for dirigible balloons for distance covered and duration of flight.

As an instance of how safe a trip in a Zeppelin is considered in Germany, it may be said that such precious human freight as the King of Wurtemburg, Prince Henry of Prussia and the Crown Prince of Germany have traveled in these mighty dirigibles, which more than any contrivance yet built by man deserve the much-abused appellation of airship, for ships of the air they certainly are.

THE NEW MAXIM AEROPLANE

By Sir Hiram S. Maxim

(From London Flight)

SIX years ago I commenced making drawings with a view to building a flying machine with a petrol motor, but I did not finish it at that time, as I had a lot of other work on hand.

All the flying machines which have been built in recent years do not differ much from my original Baldwyn's Park machine, except as regards size and the kind of motive power employed.

About eighteen months ago, in making a careful study of the whole subject, it appeared to me that the Baldwyn's Park type of machine, with slight modifications, was still the best that could be devised. I therefore decided to make another machine, on practically the same lines, but very much smaller, and to drive it with a petrol engine.

I made the drawings, and about twelve months ago started to make a new light engine and a reliable carburettor, in fact, everything relating to my present flying machine.

The engine which I designed has four cylinders, each 5 ins. in diameter, with a common stroke of 5½ ins. The cylinders, pistons, connecting-rods, and the crank-shaft, are made of a special brand of "Vickers" steel, which perhaps is the strongest and toughest steel that has ever been produced, in fact, I have never seen anything to compare with it. It has a tensile strength of 57 tons, with an elongation of 14 per cent. This is remarkable, and it enabled me to make all the parts of extreme lightness and still have a reasonable factor of safety, moreover, the great lightness of the moving parts enables the engine to run faster if required than it would if the parts were heavy.

In order to get a high speed if required, I made all the passage ways and valves of the engine very large and free. I had noticed at the various places on the Continent where I had seen flying machine engines in action that they worked very badly and unsteadily, the exhaust being very irregular. A study of this question demonstrated only too clearly that the great trouble was with the carburettor; the explosive charge was not thoroughly mixed, or perhaps not mixed at all, and never of a uniform density.

I therefore experimented on a carburettor and made one that would produce gas of a uniform density, and it was found that when the air and the gas were thoroughly mixed before they entered the cylinder at all, the petrol engine behaved exactly as a gas engine does. The exhaust was perfectly regular, and, as a well-known steam engineer said in witnessing the running of my engine, "It runs as steady as any steam engine I have ever seen, and altogether different from any other petrol engine."

This engine has a forced circulation, and everything about the engine, including the spindles of the exhaust valves, is cooled, so there is never any overheating.

A new system of oiling is also used. A small pump, having a bore of 1¼ in., and a stroke of 1½ in., is so arranged and driven by a train of gears and "clockwork," that the piston is raised against the resistance of a spring, and liberated four times in a minute, and the spring is of sufficient strength to produce a pressure of 120 lbs. per sq. in. on the oil, the result being that every part of the engine, including the gudgeon-pins, is thoroughly lubricated four times a minute, and it has been found that no excess of oil gets past the piston into the explosion chamber.

The screw propellers are three in number. One is placed directly on the screw shaft, and runs, of course, the same speed as the engine, and takes the place of a fly-wheel; the others are very much larger, and revolve at a much slower rate.

Two of the screws, the small one, and one of the large ones, rotate in a right-hand direction, and the other one in a left-hand direction, but the left-hand screw has a finer pitch than its mate, and revolves at a higher velocity, just high enough so that its gyroscopic action is equal to the gyroscopic action of the other two screws, and the rotating parts of the engine; therefore there is no gyroscopic action at all when the screws are considered *ensemble*, as the left-hand screw exactly neutralizes the gyroscopic action of all the other rotating parts.

The framework of the machine has been made of American yellow pine of a very fine quality. Although it is not quite so strong as spruce per square inch, it is really stronger than spruce when considered in terms of its own weight. Moreover, spruce was difficult to obtain.

The machine has fore and aft rudders (balanced) and one horizontal rudder also balanced.

The main part of the machine is made up of six aeroplanes; the central section carries the machinery and the driver, and the two side sections are simply superposed wings, but they are not level. The outside ends are raised very much above the central section, and their surfaces are curved in such a manner that when the machine is in the air whichever side is the lower will lift the most. This ensures lateral stability, without the necessity of any machinery.

I know that some mathematicians might dispute this, as they believe, or think they believe, that the pressure on the aeroplane is always perpendicular to its surface, but if they would give the matter one moment's careful consideration they would know that such is not the case.

It would be the case, I will admit, if the whole machine was mounted on a shaft, and could rotate in the air after the manner of a windmill, but the machine is not mounted on a shaft, it is suspended in the air and resting on the air, and falling through the air at the rate of 6 or 7 miles an hour. True, it is going ahead at the same time, but nevertheless it is falling as relates to the air, therefore its downward motion through the air, while traveling, has the same effect as it would if the machine was not traveling at all, but simply falling through the air. Therefore, the side that is lowest and presents the best angle to the wind, and also presents a lifting effect farthest from the center of gravity, must lift the most, and have a strong tendency to keep the machine on an even keel.

The center of gravity, however, is very low, and very much below the center of lifting effect. This, of course, also tends to keep the machine right side up.

I have also applied a device which I invented and patented many years ago, which enables the pilot to vary the pitch of the wings while the machine is still in flight; but instead of doing it after the manner of the Wright Brothers, I strictly adhere to my original patent, the wings being moved in one direction by hand, and in the reverse direction by a spring. But this device I do not think will be absolutely necessary on account of the shape of the wings and the arrangement of the weights.

In making this machine I have sought to group all the parts together, as near as I can, in line (tandem) in order to reduce the atmospheric resistance as much as possible, and to have what there is of it in the path of the screw, that is, the motor, the driver, the densest part of the framework, the magneto, steering gear, and the petrol tank are all placed in line very low down, and all in the path of the small screw, so that if it should take, we will say, 10-h.p. to overcome the resistance of these parts, the 10-h.p., having been expended on the air itself, would draw the air forward in the direction of flight, so that the screw would be running in air which was already advancing, and fully 80 per cent. of the energy would be recovered by the screw.

It is the same also with the two large screws. All the parts that offer considerable resistance are forward of the screw, so that as much as possible of the energy lost in atmospheric resistance will be recovered.

The width of the aeroplanes fore and aft is 6 ft. 6 ins., and they are 6 ft. 6 ins. apart.

I have not given so much curvature to the aeroplanes as one would find on most of the machines of the present day, because in my early experiments I found that, when we consider the lifting effect of an aeroplane in terms of the drift, the thin aeroplanes, which are only slightly curved, do the best. Quite true, they do not lift so much per square foot, but they lift more per h.p., and I have preserved the shape which was found best at Baldwyn's Park.

Both the top and the bottom sides of the aeroplanes are covered with very thin and extremely strong waterproof silk. It is altogether the strongest and lightest I have ever seen, weighing only about 2 ozs. to the square yard.

This silk is faced on to the aeroplanes with a great deal of care, and the whole of it as tight as a drumhead.

The aeroplanes are thin and sharp. The stays are of two kinds—oval steel and flat steel, and the struts partly of oval steel tubing and partly of American pine.

The total width of the machine is 44 ft.

One of the novel features of the machine which makes it look so much neater and simpler than other forms is the manner of constructing the frame and mounting the screws. Instead of having a lattice-work frame running round the screws to support the aft rudders, the screws are not mounted on a rotating shaft, but rotate themselves on a part of the framework of the machine.

In fact, the real foundation of the machine consists of two steel tubes, to which everything else is suspended or attached, and it is these steel tubes on which the screw propellers rotate.

This enables the principal member of the framework of the machine to pass directly through the center of the screws, as an extension of these steel tubes carries all the rudders—fore, aft and vertical.

The screws being of very large size—over 11 ft. in diameter—of necessity have to be made very thin, in order to be light, and also in order to cut the air with little resistance. They are of pine, of the Baldwyn's Park type, which is common to nearly all machines at present, but a new feature has been introduced.

As these screws are not strong enough by themselves to stand the thrust without being distorted and broken, they are held back by strong steel strips 3/16 in. thick, and about 1½ in. wide.

These strips, having the same pitch as the blades themselves, also act as a screw propeller, cutting the air keenly, and being very efficient. The screws are therefore held in position, their blades can neither be twisted nor deformed, and there is nothing to prevent their cutting through the air with the least possible resistance. By this means a very large amount of air can be engaged—a great deal more than has ever been engaged before per h.p.—therefore there would be less slip than with any other system so far invented.

Moreover, the resistance required for driving the machine through the air would be less, because everything is much sharper and smoother than in any other machine I have ever seen, but unfortunately a large and level field is not obtainable near the Crayford Gun Works at the present moment. True, land can be obtained, but it costs a lot to get it and to level it off and protect it, so I have devised a new system of testing—one that I think is quite different from anything suggested before.

I have constructed a tarred sand circular track, having a circumference of 2,200 ft. This track is 25 ft. wide, and in the center I have erected a steel mast, to which I propose to attach a steel wire rope about 35 ft. from the ground, and to hold this rope up by very fine wires from another support over 100 ft. high. The steel wire will have attached to it three branches, which will take hold of the machine in three places, and in this way the machine will be held on an even keel, as far as relates to "port" and "starboard," but will be free to move forward, to ascend and descend; and will also be free to depress or elevate the forward end, that is, every movement which is necessary to make when testing a machine is obtained, while the machine is prevented from flying off at a tangent.

It will therefore be possible not only to try the working of the engine, the cooling effect of the air, the propulsion of the screws, the lifting effect of the aeroplanes, the balancing of the weights, and, in fact, everything connected with the working of the machine, without any danger whatsoever of injury to the pilot or breakage, while it affords a unique opportunity for the pilot to learn to manipulate all the necessary steering-gear, and so forth, and it is very evident that after this has been done for a certain length of time, the machine may be connected with a single wire, so as to find out if all the other movements are completely under control, and after this free flight ought to be quite simple and safe.

At any rate, a circular track will always afford a very simple manner of teaching men to fly, because they can do it without danger to themselves or to the machine.

WINGS

By Charlton Lawrence Edholm

THE hand of man, emerging from the mist
Of primal ages, was a hairy fist,
All blood-bedabbled; for the hand had killed
Before it learned to sow and reap and build.
So each new tool was but a weapon fit
To add new terrors to the blow of it;
The first rude ax was formed for bloody deed,
Split skulls before it served the builder's need
And thus through ages runs the tale; by worst
Of uses is the new-found tool accurst,
Yet we believe what prophet's words record,
That into plowshares men shall beat the sword.

For centuries we stood upon the edge
Of space and yearned, while sparrows from the hedge
Took flight and taunted us. "That I had wings!"
'Mid stormy music, thus the Psalmist sings,
"Then would I fly away and be at rest."
And lo, the wings are ours, a gift, the best
The genius of our race has forged; a tool
Fit for our eager age. What says the fool,
The War-brute? "This is *mine*, for brawls and strife,
As hawk-wings are the hawk's—for taking life!"

Well, claim them, War-god! Use them till the race
Will kill for you no more. What narrow space
Holds man to-day apart from brother man,
A range of rock, a river or a span
Of channel; and our wings shall overleap
These dwarfish landmarks. *Then* what king shall keep
His folk from merging with humanity
As waters intermingle in the sea?

Sail forth, winged Argonauts of trackless air,
And as upon your homeward course you fare
Bring heav'nly treasure. Neither gold nor steel,
Nor gross and earthly wealth weight your light keel:
Man's Brotherhood, bring *that* as Golden Fleece
On sun-bleat wings, bright harbingers of peace.
—Popular Mechanics.

CLUB NEWS

Compiled by Ada Gibson

Aero Club of America

By Charles H. Heitman

ON February 17th the original Aero Club of America became a thing of the past. In its place there sprung into life a new Aero Club of America well worthy of the name. Its headquarters, now being luxuriantly furnished, are located in the United Engineering Societies Building, and it was fortunate in securing for its head Cortlandt Field Bishop, formerly President of the old Aero Club of America. Under Mr. Bishop's guidance much work has already been accomplished.

All the leading Aero Clubs throughout the country have affiliated with it, its membership is growing rapidly, and it is arranging dates for Aviation meets for all parts of the United States. Preparations are being rapidly completed for both the International Aviation and Balloon Races to be held this year.

On March 24th the Annual Banquet of the Club will be held at the Hotel St. Regis, and but few seats in the banquet hall still remain unreserved. Prominent speakers have accepted the Club's invitation to deliver addresses.

When entries closed on February first for the International Balloon Race twelve challenges had been received as follows: Germany, 3; France, 3; Denmark, 1; Italy, 2; England, 1; Switzerland, 2. The Aero Club of America will have three teams defend the cup, making fifteen competitors altogether.

Entries closed on March 1st for the International Aviation Race, and seven challenges have been received as follows: England, 3; Italy, 1; France, 3. The Aero Club of America will also defend this trophy with three teams, making ten competitors altogether.

The places where both these contests are to be held have not yet been decided upon, for while the place for the balloon race must be named March 1st, it was impossible to do so because the cup, and the official decision of the International Aeronautic Federation had not been received. So many applications have been received to represent America that elimination races will have to be held.

The amount of coal gas consumed during the year 1909 was 255,281.70 cubic meters which entitles the Club to eleven votes at meetings of the Federation.

The officers and directors of the new Aero Club of America are as follows: President, Cortlandt Field Bishop; First Vice-President, Samuel H. Valentine; Second Vice-President, Dave H. Morris; Third Vice-President, Clifford B. Harmon; Treasurer, Chas. Jerome Edwards, Secretary, William Hawley. Governors: Cortlandt Field Bishop, James A. Blair, Jr., Philip T. Dodge, Chas. Jerome Edwards, A. Holland Forbes, L. L. Gillespie, Allan R. Hawley, J. C. McCoy, William W. Miller, Dave H. Morris, Charles A. Munn, Samuel H. Valentine.

The following dates have been officially decided upon for the National and International meets by the Committee of Meets, consisting of A. B. Lambert, Carl G. Fisher, Allan R. Hawley and Cortlandt Field Bishop. The International Balloon Race will take place at St. Louis on October 17th, and the National Championship Balloon Race (which is the elimination race for the International) will be held at Indianapolis, September 17th. The date of the International Aviation Meet has been fixed for October 25th to November 2d, but the place has not yet been decided upon. The Indianapolis Balloon Race will be held on August 12th and the Illinois Meet will take place on July 5th and 6th. There will be a prize for balloons of a capacity of 600 m. to 1,200 m.; and another prize for 1,200 m. to 2,200 m.

Augustus Post of New York, George P. White of Indianapolis and E. Percy Noll of St. Louis, have been appointed to act as official measurers of balloons in all contests.

Aero Club of Pennsylvania

By T. T. Tuttle

ALTHOUGH only a little more than two months old, the Aero Club of Pennsylvania has already established comfortable headquarters in the Betz Building, Philadelphia, has averaged more than one new member for every day of its existence, and is now actively engaged in preparation for an aeronautic meet during July or August, having petitioned the National Committee on Meets for ten days during this period.

The Club was organized at a meeting held on December 17, 1909, and in our session elected officers to serve until the first annual meeting, April 1, 1910, adopted a constitution and by-laws, appointed committees on headquarters, grounds, etc., and on the following day the committee on incorporation prepared the application for charter. The Club will apply to the Aero Club of America for affiliation as soon as the charter is granted.

The officers of the Club are: President, Arthur T. Atherholt; First Vice-President, R. H. Beaumont; Second Vice-President, Louis J. Bergdoll; Treasurer, Laurence Maresch; Secretary, Jack Hiscock, Assistant Secretary, Carl H. Carson; Directors, Rev. George S. Gassner, Robert H. Carson, Clarence P. Wynne and Thomas T. Tuttle.

HENRY M. NEELY, CHAIRMAN OF COMMITTEE OF ARRANGEMENTS, AERO CLUB OF PENNSYLVANIA.

In January the Club sent its President to St. Louis to attend the first national convention of aero clubs, and as a result has started a movement to hold a large meet in Philadelphia. Henry M. Neely is chairman of the committee in charge of the arrangements, and already various trades bodies of Philadelphia have pledged their support. Joseph F. Rhodes, Civil Engineer of the Club, is now making a survey of the grounds in the southern end of the city. The course which he is mapping out is of the regulation three and a quarter miles length, and is entirely within the city limits. It is also within easy trolley distance of any part of the city and is reached by a suburban line of cars, and by all the steam roads entering Philadelphia via the belt line. The Club claims for the course that it is the most convenient for spectators of any course in the world.

ADOLF BRODBECK, PH.D., PRESIDENT OF THE UTAH AERO CLUB.

Members of the Club now own a Blériot and a Curtiss machine, and other aeroplanes are in course of construction. It is expected that there will be at least a half dozen local entries for the meet, besides which outside aviators will be invited to compete.

Hartford Aero Club

By Hiram Percy Maxim, President

AERONAUTICAL matters are taking a hold here in Connecticut. We have the Aero Club of Hartford, of which the writer is the President, and which is composed of the most progressive gentlemen in this locality. Regular meetings are held, and plans are already under way for a series of soaring contests during the coming summer. I personally have purchased a Wittemann glider, and arrangements have been made for the control of an aviation field on the very extensive meadows on the eastern bank of the Connecticut River. A commodious hangar or garage for housing gliders has been established by the Connecticut Aero Company, convenient to these grounds. This company has been recently formed by Mr. G. E. Lucas of Hartford, and active steps have been taken to secure the agency of different aeronautical apparati. Instructions in soaring and gliding will be given by Mr. Lucas during the coming summer. This is our first publicity venture.

The University of Pennsylvania Aero Club

By George Atwell Richardson, Secretary

IN making the first aeroplane to be constructed by students of a university, the Aero Club of the University of Pennsylvania is following precedent in taking a leading part in aeronautics.

Two scholars connected with the University of Pennsylvania, Rittenhouse and Hopkinson, were instrumental in bringing about the first aerial voyage made by man, on this side of the Atlantic.

The first ascension ever made was in Paris on November 21, 1783, in a Montgolfière or hot-air balloon, and it was just seven days later that the Philadelphia ascension took place. It was thus the second ascension ever made in the history of the world, but it was the *first* made by the aid of a gas lighter than air (the several balloons or gas-bags used in this first American aerostat being filled with hydrogen instead of hot air, as in the Paris ascension).

The matter of forming an aero club at the University of Pennsylvania was considered at the beginning of the college year 1909-10, and one month later, November 1, 1909, the first meeting of what is now known as the University of Pennsylvania Aero Club, was held. Fourteen men, who constitute the charter members of the organization, were present at this meeting. Various plans were discussed and officers elected as follows: President, F. H. Decham; Vice-President, E. E. Wright; Secretary, G. A. Richardson; Treasurer, J. F. Rhodes; Superintendent of Construction, Carl H. Carson.

At a meeting held a few days later Mr. H. L. Willoughby, Class of 1877, and a well-known member of the Aero Club of America, was elected Honorary President.

After the first meeting the membership rapidly increased, and there are now about seventy names of active members on the rolls, besides those of a considerable number of associate members.

One of the first things done once the Club was on a firm basis, was to make active preparations to build a full-sized aeroplane. A number of members guaranteed a certain amount of money to start construction.

Mr. Lawrence Lesh, a protégé of Octave Chanute, and considered one of the best informed aeronauts in the country, offered his services, which the Club gladly accepted. With his aid plans were drawn up and actual construction started on a biplane during the Christmas vacation. The progress since that time has been very satisfactory, but has been delayed owing to the lack of a suitable engine and several other causes. It is hoped, however, to have the machine ready for trial flights by the time good weather comes. All the work done, so far, has been done by student members of the Club.

Besides the aeroplane and a new type of glider, which are under construction, the Club is the owner of a bi-plane glider, which was presented to it through the efforts of Mr. Geo. Brooks, an alumnus of the University. Gliding practice will commence as soon as the weather permits.

On February 26th the University of Pennsylvania Aero Club, acting in unison with the Aero Clubs of Cornell and Columbia Universities, sent out invitations to an Intercollegiate Aero Convention to be held in Philadelphia on April 1st and 2d. The invitations were sent to every college in the United States having more than two

CHARLES G. GARFIELD, DIRECTOR OF AERO CLUB OF ROCHESTER

hundred students, and also to a number of the leading colleges and universities in Canada and Mexico.

This convention will be the first one of its kind ever held, and it is hoped that it will be a big success. It is planned to form an Intercollegiate Aero Association which will become affiliated with the Aero Club of America, a thing which will put flying on a par with every other form of university activities.

Aero Club of Rochester

By Arthur E. Partridge, Secretary

THE Aero Club of Rochester, which was organized in November and incorporated under the laws of the State of New York, December 20, 1909, promises to become a flourishing organization, as it is composed of sixty-five active members drawn from the best professional and business men of that city. It was organized almost spontaneously after the Board of Park Commissioners had granted the Elbridge Engine Company permission to use Reservoir Park, a new public property given to the city by George Eastman, the kodak millionaire, for experimental purposes by local men interested in air-craft. As soon as it became evident that the mayor was inclined to take the application from the viewpoint of a serious proposition and to regard the question of aeronautics as a serious and progressive study, many enthusiasts who had been disinclined to uncover their ideas for fear of ridicule "hopped on the band wagon" and backed up the application. At a preliminary meeting nearly forty came to the front, and, when formal organization was completed, the charter list was sixty-five, and it was decided to close the roll with that number, and put further applicants on the waiting list. This now numbers a score.

The officers of the Rochester Club are: President, Charles H. Ocumpaugh; Vice-Presidents, Harry G. Strong, Walter W. Powers and N. R. Potter; Treasurer, William J. Trimble; Secretary, Clarence W. McKay; Assistant Secretary, Arthur E. Partridge; Board of Directors, S. R. Clarke; Charles F. Garfield, Clarence W. McKay, C. H. Ocumpaugh, T. H. McInnerney, W. W. Dake, Ernest H. Millard, Lyman Seely and Robert M. Searle.

The policy of the Club will be sane, and no attempt will be made to do more at present than to assist the general movement and participate in anything tending towards the progress of aeronautics and its proper regulation. Experimental flights with gliders have been made with success, and when the weather becomes milder several local men will attempt flights with machines of their own invention. Several members are much interested in the dirigible, and the Club may rent one or two balloons to add to purchases in that line which have been or are about to be made.

Aero Club of Buffalo

By Dal H. Lewis, Secretary

THE Aero Club of Buffalo is doing everything it possibly can to promote the sport of flying. We are now getting as many models of aeroplanes as it is possible, and these, together with two or three complete flying machines, we are going to exhibit at the Buffalo Power Boat and Sportsman's Show, which takes place in this city from 21st to the 30th March.

We propose to hold on April 1st, in the Sixty-fifth Regiment Armory, the first of a series of model aeroplane contests.

The most important event we anticipate arranging for this year is a real aviation meet of possibly a week's duration, and it is the present intention to have this take place some time in June.

We are communicating with aviators of more or less fame, with the idea of finding out whether or not they can participate in our contests, and as soon as we are assured of a satisfactory entry, it is our intention to "jump right in" and endeavor to give the people in this vicinity some sport worth seeing.

The officers of the Club are as follows: President, John M. Satterfield; First Vice-President, H. A. Meldrum; Second Vice-President, Howard A. Forman; Third Vice-President, Robert K. Root; Treasurer, George P. Urban; Secretary, Dal H. Lewis. Board of Directors: John M. Satterfield, H. A. Meldrum, Howard A. Forman, George P. Urban, Robert K. Root, E. R. Thomas, James How, George Bleistein, Ralph Sidway.

Atlantic City Aero Club

The Atlantic Aero Club was organized on March 10th by a body of prominent business men of Atlantic City, N. J. The main object of the Club is to generally assist in the advancement of the art of flying.

CLARENCE W. M'KAY, SECRETARY OF THE AERO CLUB OF ROCHESTER

It is the intention of the Club to organize a big National Aviation Meet in June next, at which $100,000 in prizes will be offered.

It is also another bidder for the International Aviation Meet which takes place October 25th to November 2d. The many natural advantages of Atlantic City, together with its great hotel accommodations, railway facilities and perfect aviation grounds, should be of material assistance in the securing of this great event for that city.

A Committee of Meets has been formed, with C. W. Bennett, a man of great experience and exceptional organizing abilities, as general manager.

As an earnest of the faith and enthusiasm of the charter members of the Club the sum of $10,000 was subscribed on the spot. The officers elected include the leading men of the resort, financially, socially and in every way, as the following list will testify:

President, John I. White, of the Marlborough-Blenheim; First Vice-President, Louis Kuehnle, President of the Marine Trust Co.; Second Vice-President, Walter J. Buzby, proprietor of the Hotel Denis; Third Vice-President, Carlton Godfrey, President of the Guarantee Trust Co.; Treasurer, J. Haines Lippincott, of the Hotel Chalfonte; Secretary, Col. Walter E. Edge, proprietor of the Daily Press and Evening Union, and of the Dorland Advertising Co. Directors: Isaac Bacharach, President of the Atlantic Lumber Co.; Albert T. Bell of the Hotel Chalfonte; C. W. Bennett, formerly of the Bennett Circuit of Theaters and Amusement Enterprises; W. J. Cherry, President of the United Paving Co.; Harry B. Cook, of the Hotel Seaside; Robert E. Delaney, of the Hotel Dunlop; William F. Hanstein, of the Royal Palace Hotel; Henry W. Leeds, of the Haddon Hall; Warren Somers, President of the Somers Lumber Co.; Dr. J. B. Thompson, of the Hotel Chelsea and President of the Chelsea National Bank; Allan K. White, of the Marlborough-Blenheim; Charles D. White, of the Marlborough-Blenheim, and Daniel S. White, of the Hotel Traymore.

The Aero Club of Washington

THE Aero Club of Washington was formally organized at a meeting held in the office of the Chief Signal Officer of the Army, on January 23, 1909, by a committee of twenty-six members assembled for that purpose on the invitation of a preliminary committee, who had prepared suitable articles of incorporation and tentative constitution and by-laws.

The articles of incorporation were signed by twenty-six members, after which a Board of Management for the current year was elected, all of its offices being filled except the presidency, which remained vacant temporarily. The previously prepared constitution and by-laws were read and adopted substantially as read.

At a meeting of the Board of Management, held at the residence of Dr. Alexander Graham Bell in May, Mr. Thomas F. Walsh was unanimously elected as the first President of the Aero Club of Washington, thus completing its organization.

During the year 1909 one hundred charter members were enrolled, comprising persons prominent in the official and social life in Washington. In addition to these, nine honorary members were chosen as follows:

The President of the United States, Count Ferdinand von Zeppelin, Louis Blériot, Octave Chanute, Glenn H. Curtiss, A. Santos-Dumont, Lawrence Hargrave, Orville Wright, and Wilbur Wright.

The aeronautic work of the Charter members has been considerable and important, embracing scientific researches, writings, lectures, physical and practical experiments, ascensions, demonstrations, balloon and aeroplane practice, governmental tests, etc., but these not being done officially for the Club are not detailed here. Of particular interest to the Club are the steps taken by its members to secure aeronautic machines and appliances, and to find suitable aeronautic grounds, convenient to the Capital, which may serve for ascensions, flights, exhibits and original experiments, thus contributing to the entertainment, instruction and active life of the Club.

At the annual meeting of the Club on January 10th all of the officers for 1910 were elected for the ensuing year by a single unanimous vote. They are as follows:

President	Thomas F. Walsh.
1st Vice-President	Robert Shaw Oliver
2d Vice-President	Thomas Nelson Page
3d Vice-President	Butler Ames
Corresponding Secretary	Allerton Cushman
Recording Secretary	Albert F. Zahm
Treasurer	Charles J. Bell

C. W. BENNETT, DIRECTOR OF ATLANTIC AERO CLUB OF ATLANTIC CITY

National Model Aero Club

By F. S. Crocker

DIRECTORS of the National Model Aero Club are: President, W. H. Crocker; First Vice-President, W. M. Sage; Second Vice-President, P. W. Wilcox; Secretary F. S. Crocker; Treasurer, M. P. Talmage, Leo Stevens, Edward Durant, A. Armstrong, L. W. Houck.

The object of this Club is to promote the study of the problems of aeronautics as demonstrated by the model, to regulate and control all competitions throughout the United States, and to promote exhibitions and contests and to secure the dissemination of the latest ideas and discoveries in the problem of flight as presented by models of either heavier or lighter than air types.

It is proposed to offer medals and cups for longest flights, best designs and originality of construction, and to generally control the study of aeronautics as applied to machines less than six feet in their greatest dimensions.

CLUB NOTES

WILMINGTON, Del., is to have an Aero Club, plans for which are being perfected and shortly this city will take its place among those of the world encouraging experiments in aviation.

David Snellenburg of Wilmington is the principal promoter of the new Club, and he with Robie Seidelinger, the inventor of several models of aeroplanes, has succeeded in interesting several wealthy residents, who have become enthusiastic over the project.

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Before his departure from the scene of his aerial triumph in San Francisco, Mr. Louis Paulhan, the famous aviator, was made the recipient of a token of regard by the members of the Ligue Nationale Française in the shape of a solid silver loving cup. The presentation was made by President Raas, who, in a neat speech, expressed the appreciation which the league had for the aviator, and complimented him upon the honors he had won in the field of aerial navigation. The cup is inscribed, "Hommage de la Ligue Nationale Française de San Francisco a M. Louis Paulhan."

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The Aero Club of Rochester has recently purchased a Franco-American dirigible balloon for racing purposes. It is of the cylindrical type, and has a capacity of eighty thousand cubic feet. It will be fitted with an Eldridge engine, and if it shows speed it will be entered in the Gordon-Bennett race next fall. The President of the Club, Mr. Ocumpaogh, has announced a trophy for the first Rochester-built aeroplane that will start from Cobbs Hill and fly to some designated point in Monroe County and back. Charles F. Garfield, of the Board of Directors, has made an offer of two hundred and fifty dollars to the first aeronaut to fly from Rochester to Mr. Garfield's country home in Eagle Island.

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An aviation society has been formed among the students of Stuyvesant High School, East Fifteenth Street, New York. Mr. Ernest R. Von Nardroff, the principal, has given his consent to the student body, which will do experimental work in the school gymnasium. Several of the society's members have been prominent in the model contests held by the Y. M. C. A. in New York.

OSCAR NEWSTROM, VICE-PRESIDENT OF THE ILLINOIS AEROPLANE CLUB, OF CHICAGO

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At the sixth annual indoor meet of Public School 77, New York, of which Mr. Edward A. Page is the principal, and which will be held at the Eighth Regiment Armory, Ninety-fourth Street, New York, on April 9th, there will be an aeroplane contest open to pupils of elementary schools and another open to members of the Aeronautic Society.

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The election of new officers of the Aeronautic Society of New York took place at the third annual meeting, held at the headquarters of the Society, 1999 Broadway, New York, on February 24, 1909. Among other business, judges for model contests were appointed, and a series of elimination trials for the Octave Chanute Cup (flying models) were arranged to be held at the Sixty-ninth Regt. Armory, New York. The first of these took place on March 3d, when F. M. Watkins, L. J. Lesh and R. S. Barnaby made several very spectacular flights. The new officers elected are as follows: President, Hudson Maxim; First Vice-President, Lee S. Burridge; Second Vice-President, William J. Hammer; Third Vice-President, Louis R. Adams; Secretary, Wilbur R. Kimball; Assistant Secretary, Alva D. Lee; Treasurer, Clarence F. Blackmore. Directors: Thomas H. Hill, Lee W. de Forest, Dr. Dwight Tracy, Charles Westley Howell, Jr., Carlos de Forest and Hugo C. Gibson. Membership Committee: Dr. Dwight Tracy, Hugo C. Gibson and William J. Hammer. Judges on Model Contest: Hugo C. Gibson, A. G. Boucher and Carlos de Forest.

N. R. POTTER, VICE-PRESIDENT OF THE AERO CLUB OF ROCHESTER

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The Aero Club of Illinois has been organized by one hundred prominent men of Chicago, the object of which is to advance the art of flying.

The organization of the Club was preliminary to the securing of a charter from the State of Illinois and affiliation of the Association with the Aero Club of America. When organization finally is completed, and active participation by members in aerial flight is under way, closer relation with foreign clubs will be promoted.

The officers of the Club are as follows: President, Octave Chanute; First Vice President, James E. Plew; Second Vice-President, Harold McCormick; Secretary, Robert M. Cutting; Treasurer, Charles E. Bartley; Consulting Engineer, Victor Lougheed. Committee on Membership, David Beecroft, Edward Wilder and James E. Plew; Committee on Exhibitions and Contests, Victor Lougheed, Robert M. Cutting and Harold McCormick, Auditing Committee, Judge Charles S. Cutting, Charles S. Castle and Joseph H. Defrees.

A monster aeroplane meet next summer is now under consideration, and the Club hopes to stage weekly meetings of the members with visiting notables. Several members have already purchased aeroplanes.

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It is proposed to form an aviation section of the New Jersey Automobile Club, to be known as the Aeronautic Society of New Jersey, to which membership fees will be charged at fifteen dollars per annum to non-members of the Automobile Club, and ten dollars to members. The object of this society will be the promotion of aviation in general and the fostering of aeronautic meets and other matters connected with the sport. The Aeronautic Society of New Jersey will be a regularly incorporated body, and have complete internal management of its own affairs. The officials and directors will be elected from its membership. The committee appointed to organize the new society includes C. E. Fisher, F. S. Holand, W. R. Kimball, A. H. Le Massena and J. F. Lanier.

EDW. E. HARBERT, PRESIDENT OF THE ILLINOIS AEROPLANE CLUB, OF CHICAGO

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The Pasadena Aero Club is negotiating for a national aviation meet, and Secretary Stevens has received a letter from George H. Harrison stating that he will help to promote the affair. Directors of the Club have decided upon the Santa Anita course as the ideal place, and they expect to negotiate with the Baldwin estate for a long term lease. Several important announcements are promised soon.

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The Cleveland Aero Club recently announced that arrangements were being made with prominent aviators to lecture before the Club. The first of these lectures will be given by M. Saulnier, Chief Engineer for the Bleriot Monoplane.

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The Aero Club of the Y. M. C. A. of White Plains, N. Y., has been organized with the following officers: President, Harold J. Carpenter; Secretary, C. Guernsey; Treasurer, Bertram Hendrickson. Members are busy building gliders and model aeroplanes.

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The Aero Club of New England has purchased a new balloon of 1,600 cubic meters capacity, to be called the "Boston II," from Leo Stevens.

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A meeting of committees representing the Aero Club of Illinois and the Illinois Aeroplane Club was recently held for the purpose of discussing the possible coalition of the two organizations.

The Aero Club of Illinois was represented by Vice-President James E. Plew and Victor Lougheed consulting engineer to the Club. The Illinois Aeroplane Club was represented by Horace H. Wild, one of the most widely known inventors and enthusiastic aeronauts of the West; President, Edward S. Harbert; Vice-President, V. A. Lamare; and John A. Montgomery, Consulting Engineer. As a result of the meeting of the two committees it is expected that the clubs will consolidate in the near future. The members of the Illinois Aeroplane Club are mostly practical mechanics and specialists in aeronautics, and a majority of them are working on heavier than air machines.

Out of a membership of thirty-five, eleven have aeroplanes under construction. Carl S. Bates and Horace H. Wild are both building monoplanes.

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The Aero Club of Utah is fortunate in having as its President a man of such vast scientific knowledge and experience as D. A. Brodbeck, who has made a deep study of aeronautics for many years past. He was at one time Professor of Esthetics in a German university, where he made a special study of the esthetic features of aeronautics.

NEWS IN GENERAL

By Mrs. J. Herbert Sinclair

AS the March number of Aircraft went to press the first American aeronautical show opened its doors in Boston. When looking back at this first effort to exhibit the products of the new art on this side of the Atlantic, it must not be forgotten to point out its perfect organization for which the initiative and energy of Mr. Chester I. Campbell are more especially responsible.

The actual exhibits were highly satisfactory, if the new-born state of the art is taken into account. Perhaps the conception of W. Starling Burgess, of Marblehead, a biplane presenting many novel features of great ingenuity, was as fine an exhibit as any made. Unless we are wholly mistaken, Burgess is a name with which aeroplane builders will have to count before many moons, just as yacht builders have had to for some years past.

If this promising newcomer had any rivals in workmanship they were the Wittemann brothers of Staten Island, who are old hands even in so young an industry as glider and aeroplane building.

Others deserving of more than ordinary notice were Schneider, as persistent an experimenter as he is a practical manufacturer; Morok, with a racy-looking monoplane; the Perkins brothers, with their great and multi-colored assortment of kites; Leo Stevens, America's premier balloonist, without whose exhibit an aero show could hardly be complete.

The Junior Aero Club's models and the L. A. W. rotary engine were also stands about which the crowd was wont to cluster. Another popular rendezvous was the miniature aviation ground in the basement, where the Church Company had toy aeroplanes constantly experimented. The International School of Aeronautics had an 8 ft. Chauvière propeller and different models of aircraft to show, including a scale model of Captain Baldwin's Government dirigible. A fine collection of pictures of aeronautical events of interest and a complete series of aerostatical instruments by Huc, of Paris, were also to be found here.

Albert C. Triaca represented the Aero Club of America, of which he is a pilot, and the Harvard Aeronautical Society, the New England Aero Club, the Massachusetts Institute of Technology were also represented.

Aircraft made a short appearance at the show; the large shipment of our first number melted into nothingness long before the curtain went down on America's first Aero Show worthy of the name.

We publish a picture of the aeroplane of Mr. A. O. Paulson, of Northwood, N. D., which clearly shows its novel mode of construction. The machine is at present propelled by the aviator, bicycle fashion, and he claims to have actually lifted himself free in this manner. Mr. Paulson intends fitting his aeroplane with a gasolene engine.

J. N. Spalding, of St. Louis, has been building a monoplane at Grafton, Ill. Mr. Spalding says he will make his first flight from Grafton, and, if successful, expects to fly across the Mississippi. The surface is 23 ft. by 5 ft. The engine is a 40-h.p. Curtiss.

Among the latest inventors of aeroplanes is Capt. A. W. F. McManus, U. S. A., retired. He claims to have made real progress toward the solving of the equilibrium problem. The main weights carried are suspended from the plane frame by pivots, an arrangement insuring perfect load distribution at all times and under all conditions; the arrangement is extremely simple and effective, and merely leaves to the operator the choosing of his own course.

Mr. C. Lewis, of Chehalis, Wash., is to build a flying machine, but has not yet furnished details.

David Neal and William Lucas, of Canton, O., have been quietly making a series of experiments with heavier-than-air machines for the past five years; they were so successful with some of their models and smaller gliders, that they have recently constructed a two-plane machine 30 x 5 ft. in dimension.

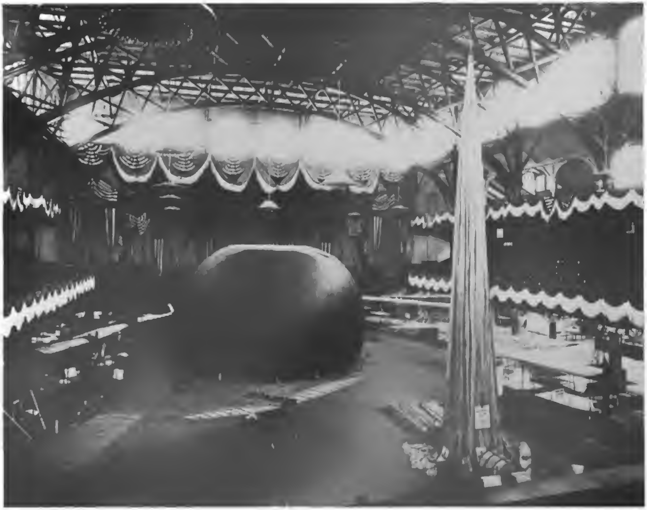
Mr. Harry Hunter, of Memphis, Tenn., may soon be sailing through the clouds above Memphis in an aircraft of his own invention. He has already drawn the plans of the machine he proposes to build, and has ordered all the material.

Pupils in the Sixth Ward Public School of Pittsburg are learning at one and the same time to imitate the bird and the fish, an art which they name "Aeroplane Swimming." They have long enjoyed a fine swimming pool, and their instructor, Prof. Walter Shook, has taken up the use of small biplanes in his course.

Sara Herzberger, fourteen years old, demonstrated the new game by gliding off a high balcony on the biplane. As she reached the pool she shook her "wings," turned a somersault and dived into the water.

Professor Shook hopes next summer to take his human aquatic birds out to the rivers and ponds to dive off the bridges and banks. Those who have tried it say it is a thousand times more thrilling than ordinary diving.

New York has a juvenile school of aviation in Eighty-sixth Street which has for its pupils boys of Public School No. 77. These boys have become tutors to others less advanced in the sub-



GENERAL VIEW OF THE EXHIBITS OF THE BOSTON AERO SHOW ject, and are making copies of their best models to be used in other schools for instructing classes. The boys took orders recently from two New York schools, from a school in Raleigh, N. C., and from the high school in Adrian, Minn. Interest is growing so rapidly that it is proposed to found a national organization with interstate meets.

Army men in the South are very proud of the fact that two of their number stationed at Fort Barrancas, Fla., have built a flying machine which has worked successfully. This sucessful flyer is the Rhoads-Titusman aeroplane.

Walter Wellman, the noted balloonist, sailed for Paris recently with the avowed purpose of preparing a balloon flight across the Atlantic, starting either from France or England. The trip is to be made in Mr. Wellman's arctic airship, which is to be equipped with new propellers and engines.

W. Starling Burgess has taken an order for the racing aeroplane to be used by Albert C. Triaca in the Gordon Bennett cup-race, in which he will carry the colors of his native Italy.

The latter received Cortlandt Field Bishop, President of the Aero Club of America, and several other officers of the Club at his International School of Aeronautics, at Garden City, N. Y., the other day, and showed them around the interesting establishment.

The balloon house for the Signal Corps of the United States Army at Fort Omaha, Neb., is a steel building 84 x 200 ft. and about 81 ft. high over all; it is intended to shelter a full-sized dirigible balloon, thus protecting it and enabling it to remain inflated when not in service, and avoiding the delay and expense of deflating it whenever it is to be used. The framework is of iron; the end of the building is provided with a two-leaf sliding door of very unusual dimensions, providing as it does an unobstructed opening of 42 x 65 ft., sufficient for the passage of a full-sized balloon. The doors are supported on grooved wheels reposing on a bottom rail, and are guided by horizontal friction-rollers interlocked with transverse upper and intermediate tracks when the doors are closed; the principal bearings are on the roof truss and on the back rails, and when the doors open they bear against a special construction in the end panel of the building made to support them and provide a suitable framework for their guide tracks.

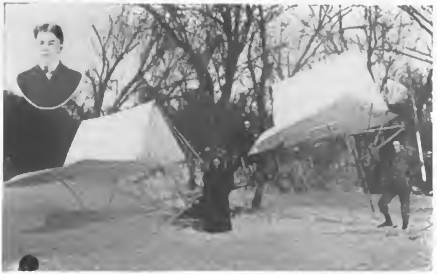
The Wilmington (Del.) Aero Co. has been incorporated to manufacture, buy, sell and deal in dirigibles, aeroplanes, engines and devices for navigating the air. The incorporators are Robie Seidelinger, the inventor of a heavier-than-air machine, David Snellenburg, of Snellenburg & Co.'s Wilmington branch, Geo. W. Crowe and J. A. Montgomery. The capital stock is $100,000.

Mr. Seidelinger's conception has some original features, and has attracted considerable attention. Its most radical departure from the construction of other flying machines now in use is the manner of support; practically everything is suspended by wires from a central Rollin mask, only what framework is absolutely necessary for rigidity is used, and the mask and wires support and hold the machine firm. Another new feature of the construction of this machine is the two movable horizontal planes, just behind the two stationary planes. These are shifted to various angles to the stationary planes when it is desired to raise or lower the machine's position in the air. The biplane is steered by means of a large vertically set rudder which, besides being capable of turning from side to side like the rudder of a ship, may also be dipped to either side in order to regain lateral stability in an emergency.

Dr. Hall, of Portland, Ore., has made final tests of the model of his aeroplane; he built it with the assistance of Dr. G. C. Whitaker and Z. A. Jarvis. This model is 10 ft. long and has 60 sq. ft. of canvas for a weight of 7 pounds. The sailing surface of the plane is made up of two sections of shellacked muslin; each section is divided into three parts; the front section is movable, and is used, instead of a special guiding plane, to direct the flying machine up or down. Work will begin immediately on a full-sized craft to be about 25 sq. ft. and have 600 sq. ft. of sailing surface; it will weigh about 200 pounds.

P. W. Wilcox, of Columbia University, is quietly working on a biplane to be ready for trials on Hempstead Plains in April or May; it will be of the Farman type. Parts are now being made and tested for suitability. Variable pitch-propellers of various blade length will be tried. Mr. Wilcox is a strong believer in variable pitch, as he showed in the course of his talk before the Aeronautic Society. Some of the ideas embodied in this machine are of a most remarkable character and far above average conceptions. They were communicated in private to Mr. Israel Ludlow, who thought very highly of them.

An aviation department was introduced at the Automobile Show in Newark, N. J., which attracted considerable attention. Among the many aeronautical exhibitors were the firm of C. & A. Wittemann, the celebrated glider builders; the Requa-Gibson Co., the motor and propeller manufacturers, and a biplane owned by and containing an engine manufactured by Mr. Boland.



AEROCYCLE OF A. O. PAULSON, OF NORTHWOOD, N. D. PORTRAIT OF INVENTOR IN UPPER CORNER

Mr. Fisher, of the Detroit-Cadillac Motor Car Co., presented a beautiful silver cup to the designers and makers of the model showing the best workmanship and the most practical ideas. The cup was won by Messrs. F. Carisi and M. Pieeller, of New York. Mr. Fisher, who had charge of the aviation department, deserves great credit for the success of the enterprise.

Capt. John Berry, of St. Louis, Mo., proposes to negotiate the summit of Mt. McKinley in a balloon steered by a mechanism of his own designing, consisting of a 4-h.p. engine and four propellers with a pull of 80 pounds each.

Bob Scanlon, of St. Louis, Mo., will accompany Captain Berry on his trip; they expect to start some time in May. The mechanism differs from any that has been tried on dirigibles; it is designed to give the pilot control of a balloon of the ordinary spherical construction. On an upright shaft 12 ft. in height are set propeller blades and rudder blades controlled by levers. The power is transmitted from a motor at the base of the shaft, which is to rest in the basket. This motor is set on a circular track, and by shifting its position a shifting of the blades is also brought about and consequently a change of direction. The rudder blades set below the propellers are intended to be used mostly for regulating the rise and fall of the balloon. The blades are of aluminum and are 8 by 18 ins. in size. The weight of the entire mechanism is 150 pounds.

Captain Berry is satisfied that it will, in its present form, do the work it is intended to do, but he plans to substitute a 10-h.p. motor for the 2 h.p. motor at present attached. The balloon he expects to use will be of 17,000 cubic feet capacity.

Mr. Heath, of Charlottesville, Va., is at work on an aeroplane for the University of Virginia Aero Club. As soon as Mr. Heath removes the aeroplane to his shed he will test it scrupulously for all imperfections, and expects to be ready to fly in a short time.

J. A. Hacker, of Chicago, Ill., has been very much interested in flying machines for a great many years; he is at present working on one which he hopes to have completed by June.

The local hotel and business men of Atlantic City are quite anxious to have an aviation meet there in June. Efforts are being made to secure the services of several aviators of prominence. Geo. Harmon, of New York City, who originated the idea has received pledges for more than $9,000 towards backing the scheme.

Mr. E. Plew, of Chicago, Ill., is erecting a building at Twenty-seventh Street and Wabash Avenue, in which he will devote 1,200 sq. ft. of floor space to aeroplane building on its completion. This space will be increased as the business grows. Chicago's first aeroplane factory is located at 240 Michigan Avenue. The machinery of an aeroplane is being constructed there and the body of the machine is at 2020 South Clark Street. It is a double monoplane designed and patented by Montgomery, the Los Angeles aviator. Mr. Plew owns the manufacturer's rights under the patent. Within a short time a company will be incorporated to carry on the business.

Charles E. Bartley, of Chicago, Ill., has been building a biplane for some time, and expects to complete it early in the summer. It follows the general lines of successful biplanes, but has a number of novel and original features.

An aeronaut who has made several successful balloon ascensions during the past is A. F. Thurston, of Meadville, Pa.; 216 flights without an accident is his record to date. His son, A. F. Thurston, Jr., made 15 flights during 1909.

Mr. A. A. Lyker, proprietor of the Empire Hotel of Gloversville, N. Y., is quite interested in flying, and begs to say that he is not only prepared to make aviators comfortable, but has ample room for housing their aerial conveyances.

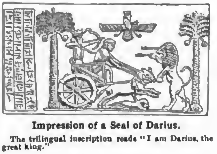
The Aero Club of the Massachusetts Institute of Technology has finished its first aeroplane glider, and is now designing a power machine from the best suggestions offered as the result of recent experiments.

The membership includes students who have worked during the summer with the Wright army aeroplane at Washington, others who were connected with Dr. Bell's aeronautical experiments and some who have studied aviation abroad. In the spring the machine will be tried out to ascertain its flying qualities. With such good talent back of it its performance will no doubt be worth watching.

The Editor of Aircraft is indebted to Henry H. Cummings, of Boston, for the following contribution to the folklore of human flight:

"Doubtless most people have believed that Green was the first 'Darius' who was interested in flying, but the enclosed copy of the seal of Darius I, King of Persia, B.C. 521, would indicate that the later Darius simply responded to 'the call of the blood.'"

Below is the seal in question:



Impression of a Seal of Darius.

The trilingual inscription reads "I am Darius, the great king."

Recognition has been given biplanes and monoplanes in the freight schedules of transcontinental lines. The Railroads Western Classification Committee placed the freight rate on flying machines at $6.00 per 100 pounds from points west of the Missouri to the Coast.

Mr. S. S. Peirce, a well-known young motorist of Colorado Springs, is having an aeroplane built at Strange's garage. The machine is a monoplane with several features suggesting the Antoinette and Blériot types of single-plane craft.

"Anything to forward aviation: it is the greatest sport in the world," that is the way enthusiastic Clifford B. Harmon expresses it; he has secured the use of 500 acres near New Brunswick, N. J., for use as flying grounds, and will erect a workshop and aeroplane sheds.

The Speedway Motor Co., of Dayton, O., is now completing its first plant for the construction of aeroplanes. The plant will have a capacity of four aeroplanes a week. Only Wright machines will be turned out. The company now has orders for 175 Wright machines.

Aerial science has worked its way into the public schools. A class in aeronautics has been established for some time in Public School 77, Manhattan; 3,000 boys all over the United States are studying the subject.

Application was made some time ago for a charter for the Philadelphia Aeroplane Co., for the purpose of building, buying, selling, developing and dealing in machines for navigating the air and their accessories. The President of the company is Clarence P. Wynne; the Treasurer, Lawrence Maresch. Their first aeroplane is now being built, and C. M. Aldrich will drive it. The machine is a monoplane of entirely new model designed by Lawrence J. Lesh. It is built for speed, and will carry but one man.

Pittsfield, Mass., is more or less of an aeronaut's heaven; its location, its distance from the sea and the lakes, its meteorological conditions, and last, but not least, its great facilities for providing sky-pilots with both quantity and quality in illuminating gas, all contribute to this. Among the more enthusiastic of the Pittsfield sportsmen practicing ballooning is Dr. Sidney Stowell, who has many an air-journey to his credit. He expects to indulge extensively in his favorite sport in the coming summer.

Mr. H. C. Crafts is also an ardent enthusiast, and it is to him Pittsfield aeronauts are indebted for the remarkable facilities offered for filling the great gas bags. Fifty thousand dollars were spent on the equipment of this gas plant, which has a special receiver for balloons; the new tank can actually hold three-quarters of a million cubic feet of gas, and this gas is of the best lifting power found anywhere.

Ballooning among the fair sex is also in honor in the heart of the Berkshires, and will no doubt receive a further boom this year.

Dr. G. R. Brownfield, of Lincoln, Neb., claims to have invented a machine that will carry six to eight passengers besides the operator, and with a balancing apparatus so effective that a weight of 200 or 300 pounds placed at the extremity of one of the planes will not disturb the equilibrium. The body of the machine consists of two V-shaped planes; this, the inventor explains, will permit a greater speed and will place the balance of the aeroplane behind the machinery. The planes are 40 ft. long and 6 to 7 ft. wide. Beneath them is a pair of wings 8 ft. in length and a propeller 6 ft. in diameter. The steering apparatus is at the front. The power is furnished by a 5-h.p. gasolene engine.

Judge Charles O. Prowse, of Hopkinsville, Ky., is building a monoplane which he expects to have finished soon.

A. S. Outcalt, of Buck Creek, Wis., has invented a combination aircraft in which a gas-bag supports the machine, and silk wings operated by an engine are the main propelling power.

It is expected to bear its load easily from any spot or place where its powerful wings have room to operate, and because of the gas bag will of course rise vertically upward when starting. Outcalt says his machine is built for safety and not for speed.

Chas. A. Chayne, of Harrisburg, Pa., twelve years of age, has completed a miniature model of a Wright aeroplane; it is an exact reproduction, and is four feet in length by three feet wide; it only lacks a motor.

Mr. L. C. Ericka, of Springfield, Mass., has a biplane which has a triangular three-propeller gear; the single propeller is in front. The planes are 20 x 7 ft., very flat, and are fitted with rocking auxiliary planes for lateral control. These are actuated by the sidewise movement of the back of the operator's seat, following the swaying of his body. There is a double horizontal rudder in front and a vertical rudder in the rear in connection with a rigid tail-plane for longitudinal stability. The framework is made of bamboo and metal tubing.

Mr. J. V. Mueller, of Wichita, Kan., has invented a flying machine which he has picturesquely christened "Prairie Eagle." The wings of the Prairie Eagle are constructed of poplar, soft pine, Oregon spruce and bamboo, and are covered with silk on both sides. The dimensions of the machine are 27 ft. across the wings by 25 ft. fore and aft. The total area of the wings is 160 sq. ft. At the rear edge on the outer ends of the wings are attached two extension wings which can be used to brake, to steer or to balance. The control of the machine in both the vertical and horizontal planes is ensured by appropriate rudders.

Wilbur Kimball has recently made several flights near Rahway, N. J., on the aeroplane recently purchased from Dr. Greene.

W. Chas. Smith, of Elmira, N. Y., is interested in a new type of aeroplane. The machine comprises a system of large planes similar to those of the Wright and Curtiss machines, together with moving spheres, rudders and steering gear; the aeroplane is expected to carry more than one person, and will be propelled by a gasolene motor. As soon as the weather permits the machine will be given a thorough test.

At the Aeronautic Show recently held in Boston, Mr. Smith secured orders for two complete aeroplanes and a number of engines, both of the 4 and 8-cylinder types. Over 100 inquiries have been received by him for engines from all parts of the country and even from Mexico.

Frederick Rugg, of Oakland, Cal., has nearly completed an aeroplane that measures nearly 32 ft. in breadth by 30 ft. in length. The two-bladed propeller has a pitch of 8 ft. Mr. Rugg will operate the machine.

Aircraft has not had the opportunity to confirm or deny before going to press the news from Dayton, to the effect that the Wright brothers are to engage on an extensive exhibition tour this year. It is said Mr. Roy Knabenshue will have charge of the exhibitions.

The names of those who are to pilot the biplanes have not been communicated, unless it be the Wrights themselves.

On March 8th Wilbur Wright was in Newport, looking over sites for an aerodrome, where, in the coming summer he could initiate to the pleasures of flying the wealthy purchasers of his machines among the Cottage Colony.

Just as Aircraft is going to press we learn Paulhan is about to make flights at Jamaica Park, Long Island. Watch for the May number of AIRCRAFT for a full description of the Frenchman's début in the East.

The Française-Américaine Aéroplane Compagnie, of 1777 Broadway, New York, reports sales from the West, the Middle West and the South.

The Church Aeroplane Company, of Brooklyn, is preparing to move into larger quarters where, with materially increased factory equipment, it will be able to treble its present capacity. In addition to turning out an immense line of flying models, and working models built to scale, orders are now being received for full-size man-carrying machines ready for installation of motor, and Mr. Church promises that with these added facilities every order will be delivered in schedule time.

The record which Mr. Church has made in this novel enterprise is not only highly creditable to himself and his energetic methods, but also gives at a glance some idea of the rapidity with which public interest in aeronautics is increasing. He started the business last fall on a modest working capital, and has continuously since then been tendered more business than he could take care of, in spite of the fact that he has augmented his factory equipment as rapidly as possible. The company itself has grown with the business, and is now incorporated, with a capital of $600,000.

Work will shortly be started on the Langley-Church machine, which is to be entered in the International Aviation Contests in November, and also on a modified form of the Santos-Dumont type. The latter is to be built under contract for Mr. Frederick Pearson, of Boston.

It is learned that the Church Company is soon to place on the market a monoplane designed to carry one aviator and sufficient gasolene for a continuous voyage of 100 miles. The price of this machine will be in the neighborhood of $4,000, and the company guarantees delivery in two months.

A flying model of this machine has been tested under all sorts of conditions, and the manufacturers claim that perfection in an automatic lateral stabilizing device has at last been attained. Details of construction have not yet been made public.

The Church Company's consulting aeronautical engineer is Mr. A. C. Triaca, and under his direction it is building a number of models and special devices for the International School of Aeronautics at Garden City.

According to Professor Kimball, of the Ogden Hotel, Council Bluffs, his city is to be one of the official aircraft stations on the trans-continental route to be established this year; the matter has so far progressed, he says, that the roof of the Ogden Hotel has been selected as the depot in that city.

RAPID DEVELOPMENT OF AVIATION

AS SHOWN BY STATISTICS

IT is not unusual to hear such a remark as the following: "I hear a lot of talk about these airships, but I don't see many around." Nor did one see many automobiles around fifteen years ago, and now it keeps one busy to get out of their way. There is nothing more convincing in the way of argument than statistics: the only way in which figures can lie is when they are of doubtful or questionable accuracy.

Such is not the case for those here presented by Aircraft: these statistics are the first of the kind ever published in so comprehensive or accurate a manner; they were not compiled from other lists and tables published elsewhere, but have been prepared with special care for this publication, and have been checked and confirmed from every possible source. It will be noticed that some of the flights were timed to the fifth of a second, whilst others, among the long ones, were timed merely with an approximation of a minute or so, but in every case the most reliable figures are given and any doubtful performance has been rigidly excluded.

Figures are dry reading to the majority, but their eloquence to those appreciative of their import is irresistible.

The tables here submitted show better than any words could the startling progress being made in the art of flight at the present day.

The first table shows the progression of the world's record for duration of flight.

In 1890, 1891 and 1897, Ader is said to have torn himself free from the earth for a few seconds in his steam-driven bat-shaped monoplanes, and in 1894, Maxim's giant machine apparently lifted itself for some moments clear of the rails it was running on.

If they are not on the record-list it is because no time was taken of these earliest hops of artificial birds and because there is no proof that they were under control at the time. We cannot share, however, the disbelief manifested by many, in these early results obtained by steam-driven machines. The evidence either direct or circumstantial is too clear, and, without wishing to detract from the merit of late experimenters, Aircraft takes the opportunity to offer this tribute to those great pioneers, Clément Ader and Sir Hiram S. Maxim.

The other tables deal only with the progress of 1909 over 1908. The second one juxtaposes the fifteen longest flights made in either year; it also gives a list of every other flight made in 1909 exceeding an hour in duration. Altogether fifty-six such flights were made in 1909, compared with eleven in 1908, and *none* previous to 1908. The third table shows the various countries in which the better known aviators have flown prior to December 31st last, spreading the doctrine of man's emancipation from the shackles of gravity. Since January 1st many of these men have flown in other countries, and new men have acquired international reputations. The fourth table shows the five men who had made flights exceeding ten minutes in duration in 1908, and the thirty-four who had flown for over half an hour at a stretch prior to 1910.

Since January 1st many names could be added to this list: Van den Born, Efimoff, Olieslaegers, Métrot, Chavez, Gaudart, previously almost, or totally, unknown as aviators, have recently made flights of more than an hour. Glenn H. Curtiss also passed the hour mark at the recent meet at Los Angeles.

Scores of men are flying daily in Europe, scores are preparing to fly here, and it does not require a particularly keen prophet to foresee that aeroplanes will soon be "seen around" by those who so far are only acquainted with them by hearsay.

ON AS SHOWN BY STATISTICS

1 " 08' 52			
1 " 04' 20" 1-5	W. Wright		
1 " 02' 15"	O Wright	September	9
57' 31"	O Wright	"	9
55' 37" 1-5	W. Wright	October	1
54' 03" 1-5	O Wright	September	24
44' 32"	H. Farman	"	29

1909

FIFTEEN LONGEST FLIGHTS.

4 hrs 17' 53" 2-5	H. Farman	November	3
3 " 15'	H Farman	August	27
2 " 49' 20"	L Paulhan	November	1
2 " 45'	H. Farman	December	31
1 hr. 40'			
1 " 37' 21" 1-5	H Rougier	"	
1 " 35' 47"	O Wright		10
1 " 32' 45"	L. Paulhan	August	7
1 " 32' 16" 4-5	H. Farman	October	20
1 " 31' 34"	H. Farman	"	1
1 " 30' 28"	J de Lesseps	December	16
1 " 23' 30"	R. Sommer	July	27
1 " 21'	H Farman	"	19
1 " 21'	H Latham	September	30
1 " 20' 45"	O Wright	July	20
1 " 20'	H. Farman	October	3

ber	30
er	10
mber	1
er	28
	10
	29
ember	29
ust	23
	5
	15
ber	29
ust	27
ober	1
y	18
tember	8
tober	2
tember	24
"	10
y	20
gust	26

1 " 01' 51" 4-5	...		
1 " 01' 23"	M Singer	cember	21
1 " 01' 20"	Lieut Humphreys	October	30
1 " 01' 15"	E. Chateau	December	12
1 " 01' 01"	L Paulhan	September	18
1 " 30"	R. Sommer	August	15
1 "	L. Paulhan	October	7
1 "	L. Paulhan	"	7
1 "	J. Balsan	December	29

III. Where the Various Aviators Have Flown

W Wright	U S A 1903-04-05-08-09	France 1908-09	Italy 1909					
O. Wright	U S A 1903-04-05-08-09	Germany. 1909						
Curtiss	U S A 1908-09	France 1909	Italy 1909					
Delagrange	France 1907-08-09	Italy 1908	Denmark 1909	Belgium 1909	Germany 1909	England 1909		
Blériot	France 1907-08-09	England 1909	Italy 1909	Germany 1909	Austria 1909	Hungary 1909	Roumania 1909	Turkey 1909
H Farman	France 1907-08-09	Belgium 1908	U S A 1908	Germany 1909	England 1909			
P de Caters	Belgium 1908-09	Germany 1909	Russia 1909	Russian Poland 1909	Turkey 1909	Egypt 1909		
Legagneux	France 1908-09	Austria 1909	Belgium 1909	Sweden 1909	Denmark 1909	Russia 1909		
Moore-Brabazon	France 1908-09	England 1909						
Zipfel	France 1908	Germany 1909	Portugal 1909					
Ellehammer	Denmark 1906-07-08-09	Germany 1908						
McCurdy	U S A 1908	Canada 1909						
F J Baldwin	U S A. 1908	Canada 1909						

1909 BROOD OF BIRDMEN.

Paulhan	France, Belgium, Germany, England.
Rougier	" Italy, Germany, England, Belgium.
Leblanc	" " " " "
Molon	" Germany, England, Belgium,
Latham	" " " "
Sommer	" Belgium, "
Bregi	" " Germany.
Le Blon	" " England.
F. Hansen	" Denmark, Sweden.
Lefebvre	Holland, France.
Fernandez	England, "
Willard	U S A, Canada.
Metrot	France, Algeria.
Guyot	" Russia.
Gaudart	" Belgium.
Shreck	" England.
Ansini	" Italy
Osmont	" U. S. A
Edwards	" Germany.
Nervoe	" " Denmark.
Obeslaegers	" Belgium.
Sanches Besa	" Germany.
Fournier	" England
Prevoteau	Denmark, Germany, England.
Dufour	France, Germany, Austria.
Speckner	" Switzerland.

IV. Increase in the Number of Competent Aviators in the Single Year of 1909

Those who made flights exceeding *ten* minutes in duration prior to January 1st, 1909

W Wright	2 hrs.	20' 23" 1-5	1908
O Wright	1 hr.	14' 20"	
H Farman		44' 32"	
L Delagrange		30' 27"	
L Blériot		11'	

Those who made flights exceeding *thirty* minutes in duration prior to January 1st, 1910.

H Farman	4 hrs	17' 53" 2-5	
L. Paulhan	2 "	40' 20"	
H Rougier	2 "	41' 36"	
L Delagrange	2 "	12'	
R Sommer	2 "	27' 15"	
W Wright	2 "	20' 23" 1-5	(1908)
H. Latham	2 "	17' 21" 2-5	
C. de Lambert	1 hr.	57'	
von Engelhardt	1 "	51'	
P Tissandier	1 "	48'	
O. Wright	1 "	44' 56"	
J de Lesseps	1 "	30' 28"	
P de Caters	1 "	17'	
L Blériot	1 "	14'	
S F Cody	1 "	01'	
Mortimer Singer	1 "	01' 23"	
Lieut Humphreys	1 "	01' 20"	
E. Chateau	1 "	01' 15"	
J Balsan	1 "		
Lieut Lahm		58' 30"	
M Farman		58'	
Hon C Rolls		55'	
Hans Grade		54' 30"	
G H Curtiss		52' 30"	
Frey		51'	
Lieut Calderara		50' 50" 3-5	
E Bunau-Varilla		41'	
H Fournier		41'	
J. Gobron		36'	
E Lefebvre		35'	
G. Legagneux		35'	
A Leblanc		34'	
H. Bregi		33' 03" 4-5	
Le Blon		30' —" 4-5	

Others who in 1909 have made flights of over ten minutes in duration are: de Baeder, Graham White, McCurdy, F J Baldwin, Willard, Hamilton, Santos-Dumont, Ruchonnet, Demanest, Métrot, Koechlin, Kinet, Shreck, Guyot, Cockburn, Moore-Brabazon, Zipfel, Gaudart, Osmont, Molon, Cagno, Payelli, Bibesco, Hanriot, Richet, the late Captain Ferber, Dufour, Sanches Besa, Valleton, Pequet, etc., etc., etc.

Women who flew in 1909: Mme de Laroche, Mlle. Dutrieu; others learning: Mlles Marvingt, Aboukaia, Misses Spencer-Kavanagh, D. Leavitt.

A. HOLLAND FORBES

YACHTSMAN AND AERONAUT

THERE is not a more enthusiastic balloonist in the United States, or perhaps in the entire world, than A. Holland Forbes, of New York, who, on account of his many trips skyward, has been dubbed by newspaper and magazine writers the "Cow-boy of the Air."

Mr. Forbes has made numerous ascensions both in this country and Europe. On October 12, 1909, he won the Lahm Cup by covering a distance of 697.17 miles in nineteen hours, starting from St. Louis and finishing twenty miles below Richmond, Virginia. On this trip he used but twenty bags of sand, which made an average loss of one bag of sand to every thirty-five miles traveled, which is considered by balloonists generally to be a splendid record.

A. HOLLAND FORBES

In 1908, his balloon "Conqueror" was entered in the International balloon race at Berlin, Germany, and attracted world-wide attention when it burst about 4,000 feet above the ground, causing Mr. Forbes and his aide, Mr. Augustus Post, to make their memorable fall without sustaining any injuries, notwithstanding that they crashed through the top of a house in the rapid descent.

In the International Endurance race at Indianapolis last June, Mr. Forbes, together with his aide, Mr. Clifford Harmon, succeeded in staying in the air for thirty-six hours with his balloon "New York," thereby winning the Endurance race. He was the donor of the Forbes Trophies of the Perpetual Challenge Cup for a point-to-point race. In his latest balloon "Viking," which he expects to launch in June, Mr. Forbes hopes to set a record for distance that will stand for years to come.

Mr. A. Holland Forbes is one of the Governors of the Aero Club of America, and Vice-President of the Aero Corporation, Ltd., which is the business end of the Aero Club of America; he is a member of the New York Yacht Club and an expert sailor; he is also interested in automobiles and owns many cars. He is the President of the publishing house of Forbes & Company, Ltd., New York, and a director of several large corporations. He resides in New York during the winter and at his beautiful country place, "Garden Court," Fairfield, Conn., in the summer.

When asked recently what the balloon has done toward progress, Mr. Forbes said that through the balloon and its development came the dirigible, and from the knowledge gained by experimenting with dirigibles and aeroplanes is resulting the conquest of the air. Ballooning in the United States is in its infancy, says Mr. Forbes, and as a sport it is unapproachable, and it is only a question of time when all men and women, who can afford it, will take it up as a recreation. It is his opinion that there is nothing to equal ballooning as a general health restorer. Mr. Forbes says that the percentage of fatalities in ballooning during the past hundred years is far below the average loss of life sustained through any other means of traveling. Most of the fatalities that have taken place have been caused by men trying to pass over large bodies of water.

According to Mr. Forbes there are only two sports worthy of attention, yachting and ballooning. The fascination of ballooning, says he, is a hard thing to express to those who have never made an aerial trip. It takes hold of one from the very first ascension. The sunrise, the lower clouds, the moonlight flickering through the clouds here and there, are inspirations in themselves. Twenty-four hours spent in a balloon, says Mr. Forbes, will do more to convince a man that there is a Supreme Being than all the preaching he may listen to during his whole life, since he comes into direct touch with Nature in all her splendor. The delights of this sport have never yet been adequately described and it is quite impossible to do so.

Mr. Forbes emphasizes the fact that no one should take a drink of liquor of any kind, either before getting into a balloon previous to making a flight, or while he is in the air. He says his height record is 18,300 feet, and the only bad effects of the air he has ever taken any notice of have been while dropping from a high to a lower level, which would cause a snapping sound in his ears. He studies air-currents in a scientific way, and hopes, through the knowledge he has already attained in this work, to be able to win the world's balloon championship in the International race this year.

This race takes place next October, probably from St. Louis, which will no doubt be chosen as it was in 1907. The winds are usually westerly at that time of the year, and should Mr. Forbes's big gas-bag be driven before a southwestern breeze, the chances of his landing near the mouth of the St. Lawrence and smashing the world's record of 1,193½ miles will be very strong indeed.

THE WRIGHTS' CONTENTIONS GROUNDLESS

By Louis Paulhan

IT is naturally with a good deal of surprise and annoyance that I learned on setting foot on American soil, that efforts would be made by the Wright Brothers to prevent me from flying on the ground that my machines were an infringement of theirs.

I had removed the usual devices for warping the wings which form part of the Blériot XI of the standard type before taking possession of my Blériots at Pau last December. I have never flown in an aeroplane with warping wings and prefer machines in which lateral control is otherwise secured.

The Blériots I have cannot, therefore, be in question at all.

As to the Farmans, I cannot for the life of me see how they can be considered infringements of the Wright Brothers' patent of 1906. In the Wright aeroplane, when one side is warped down to reëstablish equilibrium, the brake effect is so pronounced on that side that the rear rudder has to be used to prevent the machine turning around the warped side. Why they should think aeroplanes using "ailerons" or flaps, such as mine, should do the same thing, I don't know. When I pull down an aileron to secure a lift on that side I obtain the lift and *no retarding effect* is produced to warrant my using my rear rudder.

I never use this rudder for this purpose in straightaway flight, never having occasion to do so.

One of my counsel holds that the reason this occasion never arises is that as the ailerons fly normally perfectly freely in the line of the wind, their lifting effect commences directly they are made to make any angle with it, and a very small angle is all that is needed to secure a lift; in the small angles the lifting effect is immensely greater than the brake effect, the latter being wholly negligible in fact.

If the ailerons were normally at an angle of several degrees and no lifting effect was available until they had been further lowered, the brake or retarding effect would be very noticeable indeed, for its proportion to the lifting power would be much greater and I might have to use my rudder just as the Wrights use theirs.

This may well be the scientific explanation, but whatever it is, I do not use my rudder in conjunction with my ailerons to reëstablish my equilibrium, when for any reason it is affected in straightaway flight.

Neither is there necessity in the Farman for the simultaneous use of these controls in turning.

I can make quite wide turns by lifting up one side through the use of the aileron, and once the turn is started, letting the aileron go, but I usually make turns through the use of the rear rudder alone, like a ship does, and it is only if I want to make a very sharp turn that I may make use of an aileron as well as the rudder, the aileron being used to secure a greater tilt.

What I *do* consider necessary, however, is to lower the forward horizontal rudder or stabilisator when about to make a turn. I invariably do this and make the turn as the biplane dips.

That is one reason it is a good idea to fly high; another is that the air-currents are much more steady than on the surface, as the natural or artificial asperities of the earth's surface cause the sudden and dangerous gusts and whirlpools in the air.

I am glad that I am being given a further opportunity of showing America what can be done in the line of flying with high-class aeroplanes and aeronautic motors.

The machine I have is built by Henry Farman, whose competency in aviation matters is certainly equal to that of any man living. If anything is disposed in a certain way on the machine it is for some special purpose; the special disposition of the ailerons and their being allowed to fly behind like flags when not in use, is no exception to this rule.

The motor is one of the famous Gnôme revolving motors designed by the Brothers Seguin; in the nine or ten months I have been flying I have never used any other on my biplanes.

The impressions I have had of my American trip have naturally been affected by the efforts made to stop my flights, but I still hope that ere I return to France the removal of these restrictions will have enabled me to leave with a pleasant impression of my journey across the Atlantic.

L Paulhan

CRITICISM OF THE COURT'S DECISION OF FEBRUARY 17th IN THE WRIGHT-PAULHAN SUIT

By Israel Ludlow, One of Paulhan's Counsel

A LIMITATION imposed by the desire not to trespass upon the space, which it would be reasonable to expect that a criticism of the opinion of the Circuit Court would occupy, requires the mere enumeration of some of the errors which will be relied upon on appeal rather than an extended argument. In the points made, the Wright Company is hereafter referred to as the complainant and Louis Paulhan as the defendant.

The Wright Brothers' patent of May 22, 1906, is referred to as the patent-in-suit.

It was error of the Circuit Court to hold:

I. That to aggregate in an aeroplane a vertical rudder and mechanism for side control was invention, when both had been previously described in many publications.

II. That the patent-in-suit was not limited to the exact structure illustrated and described therein.

III. That the complainants were entitled to the exclusive right to a "three-rudder system of control," when no distinct claim is made to such invention in the patent-in-suit.

IV. That the use of the old rear vertical rudder to counteract the revolution of the aeroplane about its vertical axis, caused by the depression of one wing of the aeroplane, resulted in a new and patentable structure.

V. That the head-resistance decreases the velocity of the wing in greater proportion than the increase in the angle of incidence tends to raise it.

VI. That, unless the revolution of the aeroplane about its vertical axis be corrected by the use of the rear vertical rudder, the increased angle of incidence will remain ineffectual to restore the balance, but will rather further disturb it; and that it is, therefore, necessary that the rudder should be put over toward the opposite wing, thus counteracting the revolution.

VII. That it is the difference in the angle of incidence between the opposite sides of the aeroplane in combination with a rudder, which operates against the side of the lesser angle that restores the equilibrium and preserves the direction of flight.

VIII. That the equilibrium of an aeroplane could not be recovered by the use of the rear vertical rudder alone.

IX. That the invention of Ader, d'Esterno, Le Bris, and others, who warped the wings of these aeroplanes and were possessed of a rear vertical rudder, were too inadequate to constitute valid anticipation.

X. That the complainants, if their invention is the separate action of the rear vertical rudder and the warping surfaces, did not, for the purpose of deceiving the public, file a description, which was made to contain less than the whole truth, and that the patent is therefore invalid.

Upon the strength of the case made by the defendant, of which only ten points are here enumerated out of the sixty-one set forth in Assignment of Error, it is expected that a reversal on appeal of the judgment of the lower Court will be obtained.

THE INTERNAL WORK OF THE WIND

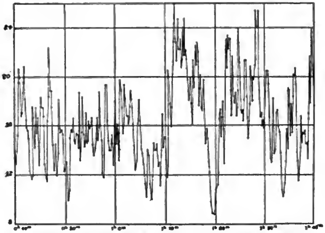
By S. P. Langley

Continued from the March AIRCRAFT

Experiments With the Use of Special Apparatus

IN the ordinary use of the anemometer (let us suppose it to be a Robinson's anemometer, for illustration), the registry is seldom taken as often as once a minute; thus, in the ordinary practice of the United States Weather Bureau, the registration is made at the completion of the passage of each mile of wind. If there be very rapid fluctuations of the wind, it is obviously desirable, in order to detect them, to observe the instrument at very brief intervals, *e. g.*, at least every second, instead of every minute or every hour, and it is equally obvious that in order to take up and indicate the changes which occur in these brief intervals, the instrument should have as little inertia as possible, its momentum tending to falsify the facts, by rendering the record more uniform than would otherwise be the case.

PLATE I.



Wind velocities recorded July 16, 1887, at the Allegheny Observatory with a Robinson anemometer registering every 25 revolutions.
Abscissæ = Time.
Ordinates = Wind velocities in miles per hour.

In 1887 I made use of the only apparatus at command, an ordinary small Robinson's anemometer, having cups 3 inches (7.5 centimeters) in diameter, the centre of the cups being 6¼ inches (16¼ centimeters) from the centre of rotation. This was placed at the top of a mast 53 feet (16.2 metres) in height, which was planted in the grounds of the Allegheny Observatory, on the flat summit of a hill which rises nearly 400 feet (122 metres) above the valley of the Ohio River. It was, accordingly, in a situation exceptionally free from those irregularities of the wind which are introduced by the presence of trees and of houses, or of inequalities of surface.

Every twenty-fifth revolution of the cups, was registered by closing an electric circuit, and the registry was made on the chronograph of the Observatory by a suitable electric connection, and these chronograph sheets were measured, and the results tabulated. A portion of the record obtained on July 16, 1887, is given on Plate I, the abscissæ representing time, and the ordinates wind velocities. The observed points represent the wind's velocities as computed from the intervals between each successive electrical contact, as measured on the chronograph sheets, and for convenience in following the succession of observed points they are here joined by straight lines, though it is hardly necessary to remark that the change in velocity is in fact, though quite sharp, yet not in general discontinuous, and the straight lines here used for convenience do not imply that the rate of change of velocity is uniform.

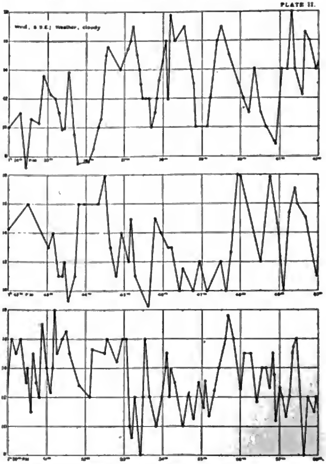
The wind velocities during this period of observation ranged from about 10 to 25 miles an hour, and the frequency of measurement was every 7 to 17 seconds. If, on the one hand, owing to the weight and inertia of the anemometer, this is far from doing justice to the actual irregularities of the wind; on the other, it equally shows that the wind was far from being a body of even approximate uniformity of motion, and that, even when considered in quite small sections, the motion was found to be irregular almost beyond conception—certainly beyond anticipation; for this record is not selected to represent an extraordinary breeze, but the normal movement of an ordinary one.

By an application of these facts, to be presented later, I then reached by these experiments the conclusion that it was theoretically possible to cause a heavy body, wholly immersed in the wind, to be driven in the opposite direction, *e. g.*, to move east while the wind was blowing west, without the use of any power other than that which the wind itself furnished, and this even by the use of plane surfaces, and without taking the advantage of the more advantageous properties of curved ones.

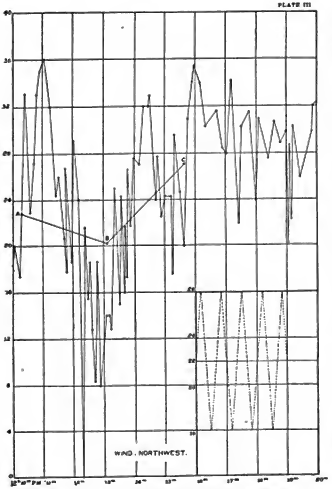
This power, I further already believed myself warranted by these experiments in saying, could be obtained by the movements of the air in the horizontal plane alone, even without the utilization of currents having an upward trend. But I was obliged to turn to other occupations, and did not resume these interesting observations until the year 1893.

Although the anemometer used at Allegheny served to illus-

PLATE II.



Wind velocities recorded January 14, 1893, at the Smithsonian Institution with a light Robinson anemometer (paper cups) registering every revolution.
Abscissæ = Time
Ordinates = Wind velocities in miles per hour



Wind velocities recorded February 4, 1893, at the Smithsonian Institution with a light Robinson anemometer (paper cups) registering every revolution.

Abscissæ = Time.

Ordinates = Wind velocities in miles per hour.

trate the essential fact of the rapid and continuous fluctuations of even the ordinary and comparatively uniform wind, yet owing to the inertia of the arms and cups, which tended to equalize the rate (the moment of inertia was approximately 40,000 gr. $cm.^2$), and to the fact that the record was only made at every twenty-fifth revolution, the internal changes in the horizontal component of the wind's motion, thus representing its potential work, were not adequately recorded.

In January, 1893, I resumed these observations at Washington with apparatus with which I sought to remedy these defects, using as a station the roof of the north tower of the Smithsonian Institution building, the top of the parapet being 142 feet (43.3 metres) above the ground, and the anemometers, which were located above the parapet, being 153 feet (46.7 metres) above the ground. I placed them in charge of Mr. George E. Curtis, with instructions to take observations under the conditions of light, moderate, and high winds. The apparatus used was, first, a Weather Bureau Robinson anemometer of standard size, with aluminum cups. Diameter to centre of cups, 34 centimeters; diameter of cups, 10.16 centimeters; weight of arms and cups, 241 grammes; approximate of inertia, 40,710 gr. $cm.^2$

A second instrument was a very light anemometer, having paper, cups of standard pattern and diameter, the weight of arms and cups being only 74 grammes, and its moment of inertia, 8,604 gr. $cm.^2$

With this instrument, a number of observations were taken, when it was lost by being blown away in a gale. It was succeeded in its use by one of my own construction, which was considerably lighter. This was also blown away. I afterward employed one of the same size as the standard pattern, weighing 48 grammes, having a moment of inertia of 11,940 gr. $cm.^2$, and finally I constructed one of one-half the diameter of the standard pattern, employing cones instead of hemispheres, weighing 5 grammes, and having a moment of inertia of but 300 gr. $cm.^2$

In the especially light instruments, the electric record was made at every half-revolution, on an ordinary astronomical chronograph, placed upon the floor of the Tower, connected with the anemometers by an electric circuit. Observations were made on January 14, 1893, during a light wind having a velocity of from 9 to 17 miles an hour; on January 25th and 26th, during a moderate wind having a velocity of from 16 to 28 miles an hour; and February 4th and 7th, during a moderate and high wind ranging from 14 to 36 miles an hour. Portions of these observations are given on Plates II, III, and IV. A short portion of the record obtained with the standard Weather Bureau anemometer during a high northwest wind is given on Plate V.

A prominent feature presented by these diagrams is that the higher the absolute velocity of the wind, the greater the relative fluctuations which occur in it. In a high wind the air moves in a tumultuous mass, the velocity being at one moment perhaps 40 miles an hour, then diminishing to an almost instantaneous calm, and then resuming.*

The fact that an absolute local calm can momentarily occur during the prevalence of a high wind, was vividly impressed upon me during the observations of February 4th, when chancing to look up to the light anemometer, which was revolving so rapidly that the cups were not separately distinguishable, I

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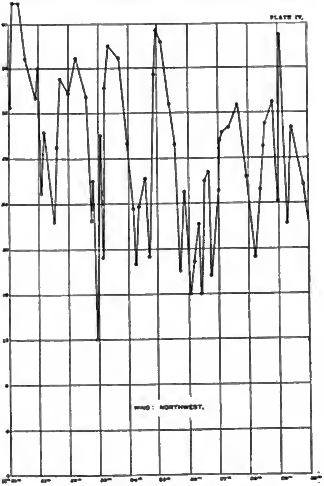
*An example of a very rapid change may be seen on Plate IV., at 12:23 P.M.



Wind velocities recorded February 4, 1893, at the Smithsonian Institution with a light Robinson anemometer, (paper cups) registering every revolution.

Abscissæ = Time.

Ordinates = Wind velocities in miles per hour.

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saw them completely stop for an instant, and then resume their previous high speed of rotation, the whole within the fraction of a second. This confirmed the suspicion that the chronographic record, even of a specially light anemometer, but at most imperfectly notes the sharpness of these internal changes. Since the measured interval between two electric contacts is the datum for computing the velocity, an instantaneous stoppage, such as I accidentally saw, will appear on the record simply as a slowing of the wind, and such very significant facts as that just noted, will be necessarily slurred over, even by the most sensitive apparatus of this kind.

However, the more frequent the contacts, the more nearly an exact record of the fluctuations may be measured, and I have, as I have stated, provided that they should be made at every half-revolution of the anemometer, that is, as a rule, several times a second.*

I now invite the reader's attention to the actual records of rapid changes that take place in the wind's velocity, selecting as an illustration the first 5½ minutes of the diagram plotted on Plate III.

The heavy line through points A, B, and C, represents the ordinary record of the wind's velocity as obtained from a standard Weather Bureau anemometer during the observations recording the passage of two miles of wind. The velocity, which was, at the beginning of the interval considered, nearly 23 miles an hour, fell during the course of the first mile to a little over 20 miles an hour. This is the ordinary anemometric record of the wind at such elevations as this (47 metres) above the earth's surface, where it is free from the immediate vicinity of disturbing irregularities, and where it is popularly supposed to move with occasional variation in direction, as the weather-cock indeed indicates, but with such nearly uniform movement that its rate of advance is, during any such brief time as two or three minutes, under ordinary circumstances, approximately uniform. This, then, may be called the "wind," that is, the conventional "wind" of treatises upon aërodynamics, where its aspect as a practically continuous flow is alone considered. When, however, we turn to the record made with the specially light anemometer, at every second, of this same wind, we find an entirely different state of things. The wind starting with the velocity of 23 miles an hour at 12 hours 10 minutes 18 seconds, rose within 10 seconds to a velocity of 33 miles an hour, and within 10 seconds more fell to its initial speed. It then rose within 30 seconds to a velocity of 36 miles an hour, and so on, with alternate risings and fallings, at one time actually stopping; and, as the reader may easily observe, passing through 18 notable maxima and as many notable minima, the average interval from a maximum to a minimum being a little over 10 seconds, and the average change of velocity in this time being about 10 miles an hour. In the lower left-hand corner of Plate III is given a conventional representation of these fluctuations, in which this average period and amplitude is used as a type. The above are facts, the counterpart of which may be noted by anyone adopting the means the writer has employed It is hardly necessary to observe, that almost innumerable minor maxima and minima presented themselves, which the drawing cannot depict.

In order to insure clearness of perception, the reader will bear in mind that the diagram does not represent the velocities which obtained coincidentally, along the length of two miles of wind represented, nor the changes in velocity experienced by a single moving particle during the given interval, but that it is a picture of the velocities which were in this wind at the successive instants of its passing the fixed anemometer, which velocities, indeed, were probably nearly the same for a few seconds before and after registry, but which incessantly passed into, and were replaced by others, in a continuous flow of change. But although the observations do not show the actual changes of velocity which any given particle experiences in any assigned interval, these fluctuations cannot be materially different in character from those which are observed at a fixed point, and are shown in the diagram. It may perhaps still further aid us in fixing our ideas, to consider two material particles as starting at the same time over this two-mile course; the one moving with the uniform velocity of 22.6 miles an hour (33 feet per second), which is the average velocity of this wind as observed for the interval between 12 hours 10 minutes 18 seconds, and 12 hours 15 minutes 45 seconds, on February 4th; the other, during the same interval, having the continuously changing velocities actually indicated by the light anemometer as shown on Plate III. Their positions at any time may, if desired, be conveniently represented in a diagram, where the abscissa of any point represents the elapsed time in seconds, and the ordinates show the distance, in feet, of the material particle from the starting-point. The path of the first particle will thus be represented by a straight line, while the path of the second particle will be an irregularly curved line, at one time above, and at another time below, the mean straight line just described, but terminating in coincidence with it at the end of the interval. If, now, all the particles in two miles of wind were simultaneously accelerated and retarded in the same way as this second particle, that is, if the wind were an inelastic fluid, and moved like a solid cylinder, the velocities recorded by the anemometer would be identical with those that obtained along the whole region specified. But the actual circumstances must evidently be far different from this, since the air is an elastic and nearly perfect fluid, subject to condensation and rarefaction. Hence the successive velocities of any given particle (which are in reality the resultant of incessant changes in all directions), must be conceived as evanescent, taking on something like the sequence recorded by these curves, a very brief time before this air reached the anemometer, and losing it as soon after.

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* Here we may note the error of the common assumption that the ordinary anemometer, however heavy, will, if frictionless, correctly measure the velocity of the wind, for the existence of "vis inertiae," it is now seen, is not indifferent, but plays a most important part where the velocity suffers such great and frequent changes as we here see it does, and where the rate at which this inertia is overcome, and this velocity changed, is plainly a function of the density of the fluid, which density, we also see reason to suppose, itself varies incessantly and with great rapidity. Though it is probable that no form of barometer in use does justice to the degree of change of this density, owing to this rapidity, we cannot, nevertheless, suppose it to exceed certain limits, and we may treat the present records, made with an anemometer of such exceptional lightness, as being comparatively unaffected by these changes in density, though they exist.

It has not been my purpose in this paper to enter upon any inquiry as to the cause of this non-homogeneity of the wind. The irregularities of the surface topography (including buildings, and every other surface obstruction) are commonly adduced as a sufficient explanation of the chief irregularities of the surface wind; yet I believe that, a considerable distance above the earth's surface (*e. g.* one mile), the wind may not even be approximately homogeneous, nor have an even flow; for while, if we consider air as an absolutely elastic and frictionless fluid, any motion impressed upon it would be preserved forever, and the actual irregularities of the wind would be the results of changes made at any past time, however remote; so long as we admit that the wind, without being absolutely elastic and frictionless, is nearly so, it seems to me that we may consider that the incessant alterations, which it here appears make the "wind," are due to past impulses and changes which are preserved in it, and which die away with very considerable slowness. If this be the case, it is less difficult to see how even in the upper air, and at every altitude, we might expect to find local variations, or pulsations, not unlike those which we certainly observe at minor altitudes above the ground *

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* In this connection reference may be made to the notable investigations of Helmholtz, on Atmospheric Movements, *Sitzungsberichte*, Berlin, 1888-1889.

Continued in May AIRCRAFT

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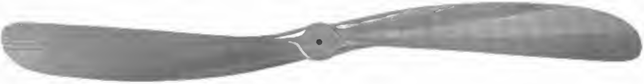

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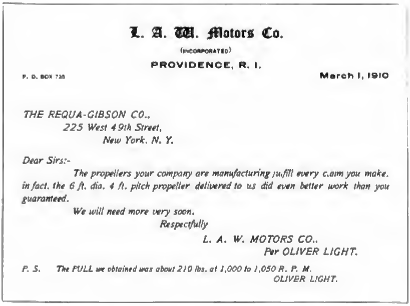

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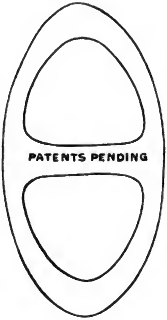

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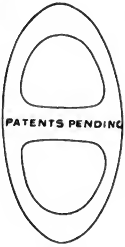

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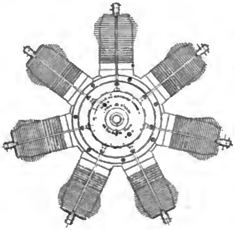

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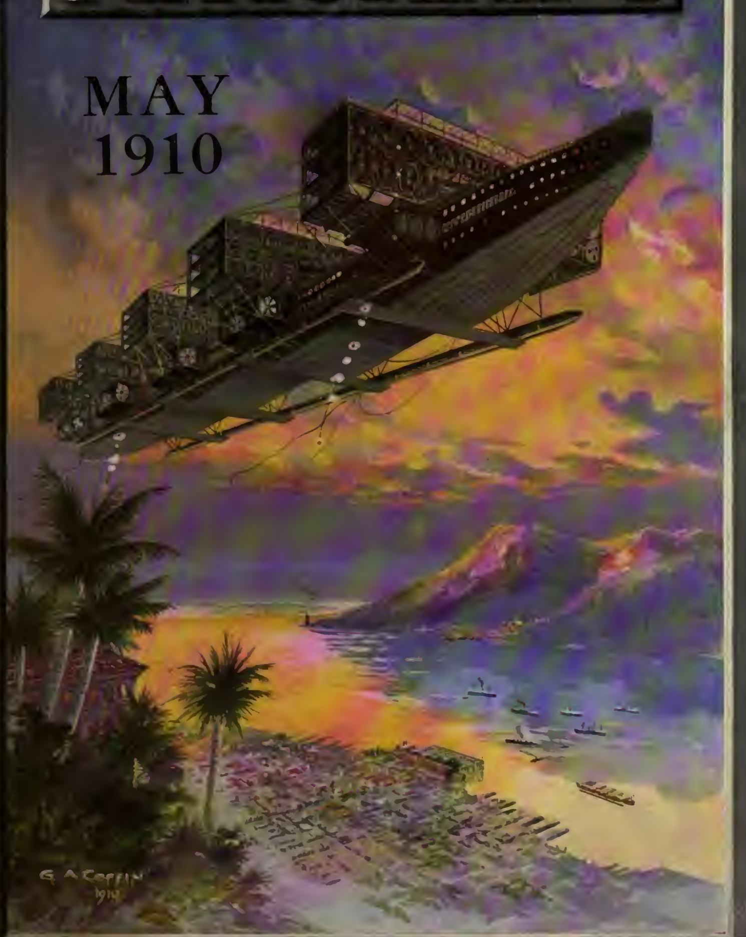

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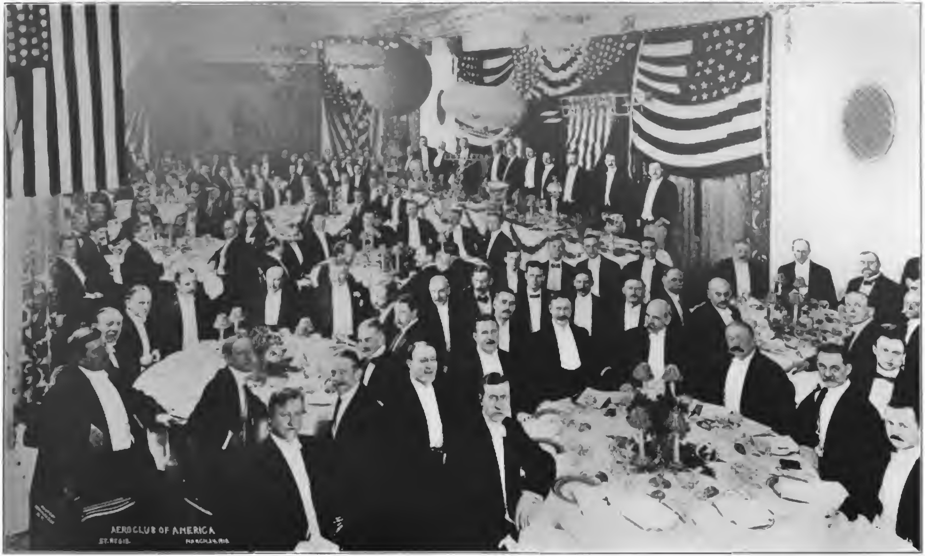

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AIRCRAFT

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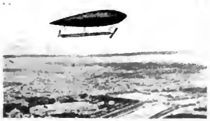
SUMMARY OF HUMAN FLIGHT

By Mrs. J. Herbert Sinclair

Continued from April AIRCRAFT.



THE FIRST BALLOON TO RETURN TO ITS STARTING POINT. "LA FRANCE" OVER PARIS, SEPTEMBER 22, 1885.

It is perhaps a pity that Paul Haenlein's ideas of thirty-seven years ago as to dirigible motor-power were not followed by experiments and researches along the lines indicated by him. It was to be many years before airships were to return to any kind of a gas engine for propulsion.

In practically every respect, however, the Haenlein airship's nearest successors, the Tissandier brothers' dirigible of 1883-84, and the Renard & Krebs dirigible of 1884-85, were its superiors.

Francis Hopkinson, Blanchard, the Roberts, General Meusnier, Leppig, Rufus Porter, the Earl of Lennox, Hugh Bell, and later Dupuy de Lôme had conceived or built craft propelled by man-force. Giffard, recognizing the utter inadequacy of such a motor power, had used steam in his dirigibles—the first motor balloons ever built. Haenlein had tried the crude gas engine of Lenoir, and in every case the power had been entirely too low to achieve appreciable results.

The period of 1873-1883 had been a decade filled with many remarkable discoveries in the realm of electricity and with many wonderful applications of the mysterious power. It was therefore somewhat natural that the well-known aeronauts Albert and Gaston Tissandier, the latter a survivor of the famous Zénith height ascension catastrophe should have thought an electrically propelled elongated gas-bag might afford the much sought key to the problem of the dirigibility of balloons.

The brothers designed a comparatively small fusiform symmetrical bag with pointed ends, of 92 feet in length (just four feet shorter than the present U. S. Army dirigible) and 30 feet in breadth, containing say 37,000 cubic feet of gas.

The motor was a Siemens dynamo of 121 pounds in weight giving from one and a third to one and a half horse-power. Four pile batteries, weighing about 500 pounds, supplied the energy, each battery comprising six compartments, each of which formed a pile element. A system of pulleys enabled one to raise or lower the reservoirs at will, thus connecting or disconnecting the liquid exciter, an acid solution of bichromate of potash.

The propeller of this dirigible weighed but fifteen pounds and was set 33 feet from the balloon. The actual speed obtained was seven to nine miles an hour; a preliminary trip was made in October, 1883, and in September, 1884, a flight of two hours and a half was made from Grenelle, during which a wide semicircle was described. It remained, however, for the second electrically propelled airship "La France," built by Captain Paul Renard, Captain Charles Renard and Captain Krebs of the military aeronautical establishment of Chalais Meudon, to be the first air-craft of any description, in the history of the world, to make a closed circuit, in other words to return to its starting point. This it accomplished on September 12, 1884, and a year later repeated the feat on two consecutive days: September 22 and 23, 1885.

This cigar-shaped balloon with its larger end in front was much larger than its immediate predecessor and of twice as elongated a shape: 167 feet in length, 27½ feet in maximum breadth; 65,000 cubic feet gas capacity. The motor developed nine horse-power for a weight of 212 pounds; the propeller was 23 feet in diameter, of 28 feet pitch, weighed 88 pounds and made fifty revolutions per minute.

The electrical generator comprised a "chromium chloride" battery invented by Captain Renard and was of extreme lightness. Each element was formed of a glass tube in which was a very thin platinum-silver electrode, in the centre of which was a zinc rod. The total weight of this accumulator was about 580 pounds, which represented 97 pounds per horse-power.

The speed of this airship of over a quarter a century ago was actually twelve to fifteen miles an hour.

It was about this time that Gottlieb Daimler and some other pioneers were experimenting with the first gasoline explosion engines, the ancestors of the present automobile motors.

The circular flight of "La France" over Paris was not two years old before Mr. Henry Deutsch (de la Meurthe), whose biography figured in last month's AIRCRAFT, conceived the idea of using the gasoline motor for aeronautical purposes. In 1889 he had one of the first gasoline driven automobiles ever built and urged inventors to take up the study of the explosion motor as the solution of aerial navigation.

It was not in France, however, that the first gasoline-driven dirigibles appeared. As a German had been the first to use a gas-engine of any description to propel an airship, so it was also a German who first used for the purpose the gasoline engine invented by his countryman Daimler.

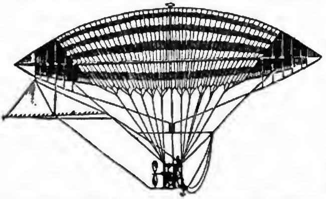
It was in June, 1897, that Dr. Wölfert and a companion, Herr Knabe, rose from the neighborhood of Berlin in a cigar-shaped balloon, ninety feet long, fitted with a Daimler motor and a two-bladed aluminum propeller. Four moderate trials were made, but on the last the gas became ignited from the gasoline of the engine, the balloon, of course, exploding instantly and Wölfert and Knabe being killed in the ensuing fall.

Although Wölfert was the first to use a gasoline engine it appears probable that David Schwartz, an Austrian engineer, had the idea before he did.

Schwartz was a remarkable inventor, but, like many such, his life was a pitiful tragedy, one of the most pitiful in the history of aeronautics.

The solution of the problem proposed by Schwartz was an aluminum balloon propelled by a motor. As far back as 1842, Marey-Monge, the Frenchman, had proposed the idea of using a metal gas-receptacle and fifty years later, when aluminum could be provided cheaply, the idea was revived by the Austrian engineer.

In 1893 he undertook the construction of the first rigid balloon ever attempted, but it collapsed during inflation, and for the three years which preceded his death he vainly strove to get funds to complete his work.



THE TISSANDIER AIRSHIP OF 1883-84. THE FIRST ELECTRICALLY PROPELLED AIR-CRAFT.

His widow carried on his task, in Germany, and late in 1897 the posthumous work was completed, and the metal balloon, driven by a twelve horse-power Daimler motor, rose into the air, at Berlin.

The thin sheets of aluminum were, however, unable to withstand the strain and it collapsed and fell, a mass of twisted metal, the occupant of the car having a miraculous escape.

Notwithstanding the failure which attended these experiments, it is possible that the lighter-than-air craft of the future—and it now looks as if lighter-than-air craft was destined to survive the discovery of dynamic flight—will be built after Schwartz's ideas. Metals of greater tensile strength to the pound and larger balloons already render a metal airship a feasible construction.

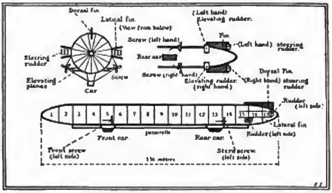
The next man to dare to attack the problem was one from this hemisphere.

Alberto Santos-Dumont, a young and wealthy Brazilian, residing in Paris, started the building of the first of his remarkable series of air-craft in 1898. This was a small cigar-shaped gas-bag, fitted with a gasoline motor; it was first experimented in 1899 and was to be followed by a dozen new or modified dirigibles which were in turn to be followed by various aeroplanes and composite machines embodying both types.

About the same time as Santos-Dumont was preparing to take up the problem, a famous German soldier and adjutant to the King of Wurtemburg, General Count Ferdinand von Zeppelin, undertook to put into concrete form the result of a life-time's study of the question of navigating the air.

He did not receive encouragement from the military authorities and accordingly organized a company. The construction of the first Zeppelin dirigible was undertaken in 1898 in a floating shed off Manzell, on the Lake of Constance, but it was not until a few months before the close of the nineteenth century,—in July, 1900,—that the preliminary trials were made.

As is well known the Zeppelins are huge rigid airships having an aluminum frame with sixteen sides, and containing sixteen or seventeen separate gas-bags.



From "The Conquest of the Air," by Alphonse Berget.

DIAGRAMS SHOWING CONSTRUCTION AND DIMENSIONS OF A ZEPPELIN DIRIGIBLE.

The annexed diagram shows clearly the principle of construction and it is to Zeppelin's undying fame as a scientist that the present models differ but in detail from his original conception.

A certain lack of stability was apparent in the earliest Zeppelin, but as early as October, 1900, a speed of from 16 to 19 miles an hour was obtained, the greatest hitherto attained by any motor-balloon, and when it is remembered that this airship equaled in size many ocean steamships and exceeded most of them in speed, although possessing engines of only 32 horse-power, the result must appear extraordinary.

From the Smithsonian Report for 1899.

THE FIRST ZEPPELIN UNDER CONSTRUCTION IN ITS FLOATING SHED ON THE LAKE OF CONSTANCE (1899). ITS SIZE WILL BE BETTER APPRECIATED IF THAT OF THE WORKMEN BENEATH IT BE NOTED.

To be continued in June AIRCRAFT.

ATTACKS ON THE WRIGHT BROTHERS WHOLLY UNJUSTIFIED

By their Counsel, H. A. Toulmin

H. A. TOULMIN.

As counsel for the Wright brothers, I am glad of the opportunity afforded by the columns of AIRCRAFT to give a statement concerning the legal and equitable situation growing out of the pending flying machine litigation and of the attitude of these inventors. I understand there is a division in sentiment concerning their attitude, and that those interested in aeronautics have drifted into two camps—one anti-Wright and the other pro-Wright.

I am surprised that there could be any such division of sentiment among the countrymen of the Wright brothers, or among those having a sincere interest in the progress of aviation. That a few who are in haste to commercialize aeronautics and to make money as showmen—as distinguished from giving scientific study and undertaking practical experiments to the advancement of the art—should clamor against the injunctions the United States courts have solemnly issued in favor of the Wrights, and against that class of aviators, is not surprising. But that there should be any genuine opposition to the attitude of the Wrights, or to the judgments of the counts, seems incredible.

The patent which embodies the Wright flying machine was issued May 22, 1906. By statute it has seventeen years to run from that date: practically four years have already expired, and but thirteen years of exclusive use of this machine now remain. Who can say, with justice or honesty of purpose, that the Wright brothers or their assignees should not have the exclusive use and control of this marvelous invention for this brief period, after which it passes to the public by operation of law?

As a reward for their years of labor and toil, for their expenditures in money gathered from savings (expenditures made almost to the exhaustion of their resources), and for the risks they repeatedly took with their lives and for their patient endeavors, the Constitution of the United States and the statutes enacted in conformity therewith promise and grant to them the exclusive right to make, use and sell this invention for the brief period of the patent. As stated, but thirteen years remain—a period approximating the time they occupied in achieving their discovery: will any just man say that they are not entitled to enjoy what the Constitution and the statutes so provide, namely, the exclusive right for the limited period?

Again, when men who are now opposed to the decisions of the courts in maintaining this right of property to these inventors, and who are criticising the attitude of the Wrights in seeking the aid of the courts, were expending no money, were giving no time and, indeed, no thought to the production and development of a flying machine, these inventors were sacrificing everything to that end; when these would-be critics were pursuing other occupations and profiting, presumably, thereby, the Wrights were working with loss, in obscurity, and without moral or financial aid or encouragement.

Now that these inventors have succeeded, why should those who have contributed nothing to the great end now accomplished, criticise the attitude of the Wrights in endeavoring to maintain through the courts the exclusive use of their invention for the brief period allowed? Do these opponents, be they few or many, realize that, when all is said and done, the real essence of their attack is not against the Wrights merely, that it is an attack on property and is opposition to the statutes and to the provisions of the Constitution?

Indeed, such an attitude of opposition is, in its final analysis, opposition to the judgments that have been pronounced by the courts in support of the ownership of the Wrights in this patent. When the Wright brothers were carrying, in silence and patience, the burdens of criticism,—if not ridicule and laughter,—for pursuing the phantom of human flight, these present critics were critics then; they have not changed their occupation; they are like the tories in the Colonial days who were bent upon tearing down and destroying every advancement made for freedom.

Throughout all ages, prior to the opening of the era of human flight by the Wright brothers in a man-carrying and man controlled, heavier-than-air flying machine, the world was without such a machine. Throughout that vast period mankind sought and longed for such a machine. Now that it has been brought into birth, is it not just that those who delivered it to the world should have it and control it for the brief period of seventeen years, of which but thirteen remain?

And this is all that the Wright brothers are asking.

If other men can devise a different principle of human flight it is open to them to do so. If any one can bring forth a different machine, different in principle and in fact, and not a colorable variation, or merely the Wright machine decorated with the outward appearance or clothes, as it were, supplied by a copyist, he is at liberty to do so, and his achievement will be welcomed by all just men, including, *absolutely including* Wilbur and Orville Wright.

Indeed, these gentlemen have, to my knowledge, extended a helping hand again and again to other experimenters: they have supplied others with valuable data, discovered and worked out by themselves, that others might produce other and different machines if they could. This very fact is alluded to in the learned opinion of Judge Hazel, in the suit by the Wright Company against the Herring-Curtiss Company and Mr. Glenn H. Curtiss. The Wrights have gone so far as to publicly announce, and the press has published the fact, that even though an experimenter were using the Wright machine or an infringing machine, he would not be molested, so long as he confined his work to experimentation and did not seek to get money returns, as by public flights. And it is the indisputable fact that no suit by the Wright brothers, and speaking as their counsel I know, has been brought against any one engaged in pursuits to promote the art, but solely against domestic and foreign persons engaged either in personally operating what the courts have since held to be infringing machines, in public exhibition flights, for gate money and other emoluments, or in conducting such enterprises as managers.

Is there a man of spirit and sound sense who, having produced a great invention and having procured a patent covering it, would not sue another who entered upon such a course as that just indicated? Not one of the now so-called critics would have done otherwise. It must be remembered that the Wrights are taking nothing from others while maintaining their rights, and nothing from the public, because neither such others nor the public had machines which could fly prior to their production by the Wrights. They are not seeking to take from others what others had before, but merely to retain that which they, themselves, were first to produce. The reverse, however, on the part of these critics and their allies, is now apparent, according to the solemn judgments of two United States Circuit Courts: others are seeking to take from the Wrights that which is theirs, rather than are the Wrights seeking to arrest the progress of the Art. If the parties who have been sued had given their time to the development of another type of flying machine, instead of giving exhibition flights, there would have been no litigation.

Nor is this all. The Wright brothers have repeatedly announced their willingness to license not only individuals who wish to fly with the Wright type of machine, but also to license exhibition-managers, committees promoting exhibition meets and, in fact, anyone who wishes to use for any purpose a Wright machine or an infringing machine. But no, these parties and their allies, while declining to properly pay the Wrights some share of these very handsome proceeds thus obtained, have started this senseless cry of monopolization of the air by the Wrights. Perhaps the old saying that "Stop thief!" is often cried out to divert attention from one's self, has some application here.

But while a few adversely interested persons are thus clamoring against the Wrights and against their patent and against the judgments of the courts in upholding the latter and the charge of infringement, the great body of American citizens and of the aeronautical world, here and abroad, recognize these inventors as the first to open the era of human flight in heavier-than-air machines, and believe, out of pure justice, that the Wright brothers should be allowed to control their invention and to profit therefrom during the brief period the patent has to run.

The American people, through their Congress assembled, sent this greeting to the Wrights:

> "For their success in navigating the air."

The French Academy of Sports made this recognition:

> "To the Conquerors of the Air, Messrs. Wilbur and Orville Wright, the first to fly with a heavier-than-air machine driven by a motor."

The Smithsonian Institution sent this message:

> "For their successful demonstrations of the practicability of mechanical flight by man."

Within the last few weeks this latter institution publicly awarded them in Washington, a suitable medal conforming to the spirit of this resolution, and during the pendency of these suits the French Academy of Sciences has awarded gold medals to the Wright brothers for their achievements. Congress and the State of Ohio have also awarded gold medals to them; so has the City of Dayton.

The Legion of Honor of the French Republic has likewise honored them.

So too aeronautical societies in America, Great Britain and France have made similar awards of medals: numerous societies have accorded them honorary membership and institutions of learning, both in America and Europe, have conferred upon them honorary degrees.

Judge Hazel, in his able opinion in the Curtiss case, made this finding:

> "It appears that machines embodying the invention in suit have made notably successful flights in France, Germany and the United States.
>
> "The first aerial flight to which the attention of the public was attracted was made at Kitty Hawk, North Carolina, in December, 1903, when the Wright machine, using a twelve horse-power motor weighing two hundred pounds, demonstrated its ability to maintain its balance, readily turn to the right or left and ascend or descend. The newspapers of the country heralded as marvelous the success of the patentees, and published far and wide that human flight had been made possible and that the patentees were the first in the annals of the world to achieve success with a heavier-than-air flying machine. Public recognition of their success was subsequently made by scientific institutions and academies of high repute in this country and abroad. Medals were presented to the inventors by Congress, by the Republic of France and by various aeronautical societies of Europe and America."

Judge Hand, through his thorough and analytical deliverance in the Paulhan case, said:

> "I cannot find that anyone prior to their patent has flown with the patented system, and that the changes from the specifications which the defendant has made are no more than equivalents, which do not relieve him from infringement."

In view of the literal truth, as briefly exposed above, I leave it to the calm judgment of just men (not to aeronautical acrobats who have been flying for money, and in no way sacrificing time and means for the development of the art), whether Wilbur and Orville Wright are doing more than common justice to themselves in calling upon the courts to maintain their patent inviolate for the brief period yet remaining, within which they are to reap that reward which the Constitution of the United States wisely ordains and the statutes are intended to carry into effect.

THE WRIGHT COMPANY IS A MENACE TO THE DEVELOPMENT OF AVIATION

By Israel Ludlow, one of the Counsel for Louis Paulhan

WHAT is the Wright patent? It is a legal instrument, a power of injunction, a possible monopoly, which, owned by a covetous and rich corporation, might threaten the very life of aviation, stifle development in this country and bar out the fruits of foreign progress.

Is not the attitude of the Wright Company, which has bought the Wright brothers' patents, that: "there is not enough profit in aerial navigation for all, but just enough for the Wright Company"?

It cannot be said that the Wright brothers are the sole inventors of the aeroplane, and that but for them the device would have been unknown. The aeroplane was the result of the inventive genius of the present mechanical age. The true measure of the reward to which the Wrights are entitled is therefore the value to the public of the temporary precedence of the first flights, keeping in mind, however, the fact that they made every effort to keep the construction of their aeroplane a secret.

The great expenditures of money (easily approximating seven hundred thousand dollars) which resulted in the development of the Curtiss, Farman and Blériot aeroplanes, are primā faciē proof that these aeroplanes are not slavish copies, but are the result of independent development.

They were brought out before the Wrights lifted the veil of secrecy they had thrown about the construction of their own aeroplane. The time was ripe, the attention of the world was attracted, the gasoline motor was created, and almost simultaneously the correct conception of the aeroplane had been born in the minds of many men in many countries: it is idle to assume that if the Wrights had not flown we would not have had mechanical flight within the last decade.

Notwithstanding the protestations of the officers of the Wright Company that they are willing to license users of all aeroplanes, absolutely no statement can be obtained from them as to their terms for any license for individual owners. Unsuccessful efforts in this direction have been made by Mr. Clifford B. Harmon and others, who have purchased Farman and Blériot aeroplanes.

I challenge the Wright Company to make public their terms to individual owners, for I doubt if anyone can get from them a permission to use an aeroplane on any terms whatever.

It is possible that the preparation for the coming show and fair season, for which an ambitious program has been planned by the Wright Exhibition Company, (a subsidiary corporation to the Wright Company), accounts for this lack of interest in possible royalties on individual aeroplanes. However, there is one gratification about the matter, and that is: that we will get a little rest from their diffident superiority; the Wrights hereafter can no longer call with good grace, in newspaper interviews, their opponents: "aerobatic showmen," for they are now instructing in Alabama,—near Montgomery,—many understudies in the art of flying, and will, it is understood, personally take charge of many of the exhibitions this summer.

In December, 1903, the Wright brothers made their first flight in a motor-driven aeroplane. Since that time they have not changed their machine, except to disconnect the tiller-rope and the warping rope, and to give the aviator a seat, where he originally lay face downward in a horizontal position.

Seven years is a long period in aeroplane history. The work of others forced the Wrights to come out into the open, and the well-wishers of the development of aerial navigation feel afraid, if the Wright Company succeed by legal methods in stopping all others from flying, that the step of progress will mark time to the tune which the Wright Company plays.

There is also considerable distrust of this new Wright Company, capitalized at one million dollars. The present stockholders of the company, it will be noted, are almost without exception the men who have held control of the street railways of New York City; to those who have known by personal experience the results of the local transit monopoly, enough has been said; but to others it should be stated, that by issue and re-issue of stocks and bonds, by the forming of holding and subsidiary corporations, the insiders grew rich, and the public suffered accordingly, with a final wind-up in a receivership and foreclosure sale.

The Wright brothers are quoted in a newspaper interview as saying that they will not bring suit against those who experiment; this statement is interesting, but of no particular value so long as they sue those who build or purchase an aeroplane for their own pleasure, or sue those who seek to make a profit by exhibiting.

The Wright Company's modest demand in the Curtiss and Paulhan suits was that their opponents' machines be delivered over to them that they might destroy them and that all profits and three-fold damages in addition be paid to it.

The Wright Company should not be heard complaining of others who are building aeroplanes, as the Wrights gave the French War Department an option on their aeroplane, and agreed to keep their invention a secret. This option ran for six months, and though the French never exercised their right of purchase, this act of the Wrights should be an estoppel of a right to appeal to the laws of this country against inventors who may make *their* aeroplanes public property. The Federal Courts are courts of equity and one of the cardinal principles of a court of equity is, "that he who comes into Court, must come with clean hands."

The United States give a right of property to an inventor in his invention on the ground that the inventor after seventeen years will make his invention the property of all for the public benefit, and Equity demands that if an inventor is willing to sell the invention to a foreign War Department, he forfeit the protection of the Patent laws of this country.

The taunt made in Court by their counsel that the Wrights have no objection to other inventors producing another type of aeroplane, may produce an unexpected result, for when the exact limitations of the Wright patent become known, undoubtedly American ingenuity will find a different method of control, which result will of course affect the value of the Wright patent, probably rendering it worthless, for at the present all records for speed, distance, height, duration and passenger carrying are held by aeroplanes other than the Wright model.

Three such devices have already been tested, and seemingly give very satisfactory results.

The Wright patent fundamentally is a combination claim between the rear vertical rudder and the side control, by which the rear vertical rudder is always turned to the side of the aeroplane having the least angle of incidence and offering the least resistance to the atmosphere. If one element of the combination is missing there can be no infringement under the present interpretation of the Courts as to the scope of the Wright patent. If therefore there is no side control, or no rear vertical rudder, or if the resistance is equal on either side of the aeroplane, so that no corrective action of the rear vertical rudder is necessary, either theoretically or practically, there can be no claim of infringement.

The legal aspects of the case have been purposely avoided in this article; but the evils and abuses of the Wright Company's attempt to place a prohibitive embargo upon the flying of others except under the Wright's tutelage and in a Wright machine are dwelt upon. The moral and equitable aspect of the Wright Company's efforts to take from the public that which now belongs to it, through the labor, experiments and expenditures of Clément Ader, Louis Blériot, Henry Farman, Robert Esnault-Pelterie, Santos-Dumont, Octave Chanute, Samuel Pierpont Langley, Alexander Graham Bell, Glenn H. Curtiss, and others, is set forth and attention is called to the point that the Wright brothers apparently never intended to make public their patent if they could sell the secret of their invention to a foreign War Department.

The Wright Company is attempting to impose an exorbitant tax upon the community for the use of aeroplanes, and is claiming a monopoly for selling, making, working, using or exhibiting aeroplanes, under the pretense that such monopoly is the reward due the Wright brothers for making public, through their patent specifications a practical aeroplane, when in truth their patent specifications contain nothing which would enable a skilled mechanic to construct a practical aeroplane. In those specifications the tiller rope and the warping rope are rigidly connected, the aviator is supposed to lay face downward in a cradle which he moves from side to side, the supporting surfaces are flat except when curved under air pressure, and the whole specifications were for a glider with no motive power shown. If the aeroplane were fitted with a motor and propeller and an attempt were made to operate the glider described in the Wright Patent specifications, the result would be one which was characterized by Louis Paulhan and other experts as suicidal. If the decisions of the Courts sustain the Wright Company in its claims, it will seriously abridge the rights of others, and will give the Wright Company power far beyond that which justice and public interest demand. The Wright Company is not fairly entitled to what they claim, for the Wright patent specifications did not give to the public knowledge of the discovery which they had made. Others, by vast expenditures of money, labor and time, reached the result they were striving for, while the Wrights kept their true invention a secret, and now, when these others have made public a practical aeroplane, the new million-dollar Wright Company seeks to take away from them the reward of their efforts. It is not an excuse that the Wrights could not disclose their invention, because an option was held by the French Government.

A patent is a bargain with the public, and is to be construed on the same principles of good faith by which all other contracts are controlled, and where there is double-dealing, secrecy, and intention to deceive by not making a fair disclosure of the invention, the patent must be construed as other bargains, and by it the patentee must stand or fall.

EDITORIAL

AERIAL CHAUFFEURS

PERCHED upon the seat of a horse-drawn vehicle, there is yet to be seen occasionally in some of the rural districts, the antiquated equestrian driver moping along the public highways behind his nag, like a pair of thoughtless donkeys, neither the driver nor the horse having sufficient intelligence to realize how far behind the procession of progress they have actually fallen.

The wide-awake chauffeur has now become the prince of the roadway and, with the aid of the modern automobile, he moves along from place to place with speed and precision and a look of magnificent contempt for the superannuated horseman.

The chauffeur at present is contented with his lot, and, like the horseman of old, feels that his position is secure from any further mechanical advance.

If you told him that the automobile is merely a step in the progress of transportation, and that it would eventually be superseded by the flying machine, he would laugh at you just as the horse used to laugh at the automobile.

The ordinary mortal can always see things that are directly in front of his nose, and to-day he is just able to see the automobile.

The extraordinary mortal, however, is looking into the future, and we find here and there men who are taking up the study of air-craft very seriously.

Over in France, where the people are a few years ahead of the rest of the world in almost every line of progress, the leading chauffeurs are beginning to learn that their positions are not so secure after all.

It is an actual fact that owing to the remarkable advance made in flying lately an automobile race cannot be held in France with any chance of success, as the people there do not care to see races of land vehicles when they can see races of air-craft.

For this reason most of the great automobile race drivers abroad are being driven from the road to the air, and their names may be seen as contestants in all the European aviation meets.

It will come to that in America soon, and in not many years from now the far-seeing and more intelligent of professional drivers of motorcars will have taken to the air as naturally as the hansom-cab driver took to the taxicab, while the dull-minded Bœotian who looks backwards for his inspirations will be left in the rear with the other débris of drifting humanity, and will join there the coachman and the mule-driver, through laboring until it is too late, under the blinding hallucination that the flying machine can never replace the earth-ridden hierarchy of crawling land-vehicles: our automobiles and horse-drawn conveyances, the donkey-carts of Sicily, the ox-wagons of India, or the goat teams which can still be seen in Sardinia in the year of our Lord, 1910.

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The demand for skillful aviators has already become enormous throughout the civilized world, in fact, there are one hundred times more machines and aviators wanted than can be supplied.

Chauffeurs should make the best drivers of air-craft, and we advise the brainy ones to get into the business at once and avoid the great rush into the new field of human industry, that is bound to follow in the near future.

Begin by thoroughly studying the subject from its various standpoints and above all get information from a reliable source.

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AIRCRAFT intends to cover, from time to time, every conceivable phase of the aeronautical movement, so that by making a collection of the different issues, our readers will possess a complete encyclopedia on the subject.

One cannot afford to miss any number any more than one can do without a select chapter of an important book.

To be on the safe side, we advise every one of our readers to subscribe to us directly for AIRCRAFT, and not take the chances of always being able to get it from the news dealers.

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A. B. Lambert, Carl Fisher, Dick Ferris, George B. Harrison and Clifford B. Harmon are a few names of men beginning to loom up big upon the aeronautical horizon lately.

UNCLE SAM MUST LOOK SKYWARD

By George F. Campbell Wood

IN most political issues, the merits of either side are sufficiently open to debate to necessitate from their upholders a most painstaking selection and careful arraignment of arguments—both forceful and subtle—before any hope of carrying conviction can be entertained, by orator or writer.

Such can hardly be said to be the case when it comes to discussing the advisability of encouraging military aeronautics in this country; and, notwithstanding the recent failure of Congress to appropriate funds for the purpose, this statement fears no contradiction from anyone with genuine foresight or even with a suspicion of what is being done in other countries.

However obvious it may be to those who have made any study of the question, it is nevertheless well to state the fact simply and emphatically, that in the development of aeronautics as a military asset and more particularly in the formation of an aerial fleet, the United States are letting themselves be distanced by every power worth considering from a martial standpoint, to say nothing of other nations which see in an air-fleet the possibility of overcoming their weakness and inferiority on land or sea.

It is small wonder, under the circumstances, that, if one excepts the Club's recent victories in the realm of Aerial Sport, little was touched on in the post-prandial orations for which the Aero Club of America's annual banquet was made the occasion, outside of this question of Military Aeronautics.

It is likely, it is even probable, that the knowledge entertained by a large majority of the general public on the adaptation of aerial navigation to purposes of war in foreign countries, is limited to an occasional newspaper-despatch relating the aerial raid of some continental dirigible, and laying especial stress upon the mishap which may have terminated or interrupted it.

If a broken propeller brings to an end a six hundred mile journey of one of Zeppelin's colossal air-cruisers, is it the stupendous triumph of mind over matter represented by such a feat which is considered, or is it the stupid and benign mechanical accident which ended it? Nine times out of ten it will be the latter, although from the standpoint of the actual results obtained, of the vindication of a principle, of the proof of a theory, it is absolutely negligible. It must be obvious that, as a result of the mishap the next propeller used will be one capable of withstanding the strain—it is but the merest detail in the great conception—but it is not obvious, until so proven, that a contrivance built by man, embodying thirteen tons of marvellous mechanism can be so "wondrously wrought" as to propel itself with safety through the clouds for hour after hour at a speed of fifty feet a second, and under absolute control of the human mites carried along with it.*

If this is fully grasped and appreciated a very significant fact becomes apparent—that it is not necessary to peer dimly into the future and prophesy and forecast, to have a workable warship of the air before one's eyes, for *such craft exist at this very hour*, and any one who considers such aerial clippers as the present Parseval IV or Zeppelin III as harmless in war is making a mistake of no mean proportions..

True, compared to the air-cruisers of the future they are as the Clermont is to the Mauretania or the Titanic, and as the three-deckers of Trafalgar are to the super-Dreadnoughts now on the stocks, but had the Clermont and her contemporary pioneers not existed, the Mauretania and her sister-leviathans would still be a dream of the future, and are not the men-of-war of the past connected with those of to-day by a long line of ancestry, a lineage in the upbuilding of which hundreds of millions in money were expended?

Progress can only be achieved, perfection can only be approached, by evolutionary construction and the deep and full experience of years of trials and also years of what in the future may appear, by comparison, as failure.

To imagine that the Germans believe,—and the Germans are here referred to because in this line of air-craft they, without the slightest question, lead the world,—to imagine that they believe their dirigibles to be without flaw or possibility of improvement is to entertain a misapprehension of even greater magnitude than to consider these dirigibles, such as they are, devoid of any practical value.

Last Autumn four large military dirigibles were engaged in war-manœuvres in the valley of the Rhine, and put through evolutions in all weathers and at all hours of the day or night, which simply paralyzed with amazement those who witnessed them.

Details were carefully awaited setting forth the exact results obtained, and calling for the international praise which is ever showered on startling performances in any novel and untrodden field of endeavor.

The "details" never made their appearance and any enquiry concerning them was met with bland smiles and evasive replies of great politeness and little information.

In thus making the results of these manœuvres a military secret, Germany may be said to have definitely established the dirigible as a weapon of war. That these results were encouraging, to say the least, may be gathered from the feverish activity now reigning in the aerial dock-yards of the Fatherland: in six or eight months the Teutonic air-fleet will comprise nearly a score of the most powerful units yet devised. All these are not warships but they are all at the disposal of the Imperial Government in case of emergency. The Zeppelin IV which is at present being built for the passenger trade, and is to be the greatest air-craft the world has yet seen, will be upheld in its element by more than half a million cubic feet of hydrogen gas. She will carry fifty passengers at about forty miles an hour, and will be capable of staying three days in the air without landing. The Parseval IV which is the largest of non-rigid dirigibles, has a gas capacity exceeding two hundred thousand cubic feet; in some respects the Parsevals are the most successful units in the fleet.

The semi-rigid type as represented by the "Gross" balloons has also shown to advantage above German soil.

There are besides these, several other airships of various makes being built in Germany; in the construction of the skeletons of the rigid ones, steel, wood and aluminum are being used indiscriminately.

General Allen, when speaking at the Aero Club banquet, made the startling announcement that there was soon to be built in Germany a rigid dirigible three hundred metres in length, to be propelled by eight motors, of which four were to be generally used and four to be used in emergencies.

On January 19th a Berlin despatch to this effect was brought to the attention of the very-much-amazed writer, but two days later the news was denied as a "canard."

Such a ship, if constructed, would be the most monumental construction for transportation ever attempted by man, and if successful would make the absolute Conquest of the Air an accomplished fact, capable as it would be of carrying from three to four hundred passengers at fifty miles an hour. It is earnestly to be hoped for the sake of the world at large that General Allen's statement will be shortly confirmed by the news that such a craft is actually being built.

But it is not only in Germany that military aeronautics are receiving the attention and support of the Government; Austria,

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* Illustrations showing construction and dimensions of a Zeppelin occur on pages 92 and 106.

Russia, Italy, Belgium, and even Spain, have each one or more dirigibles, while France and England are at last making a deliberate effort to overcome Germany's lead.

Nor is this activity confined to European nations, and those for whom the Yellow Peril is more than a mere expression may find food for reflection in the news from Japan and China, published elsewhere in this magazine.

France has but two government dirigibles at present, but before the close of the year she will have greatly strengthened her position, thanks to the public subscription of "Le Temps" which followed the disaster to the "République."

The new French airships are to have their gas-bags divided into separate compartments, to avoid a repetition of the catastrophe of last September, and are to carry two motors each, another safeguard which might have been copied from Zeppelin's first dirigible of 1900.

The re-constructed "Colonel Renard" has already made several trial trips, and the "Liberté" will soon be ready to take the air again.

The large "Clément-Bayard" airship destined for England is ready to start for Farnborough, and the news of this first Channel crossing by a manned dirigible will no doubt create quite a stir when it arrives.

Another English air-craft of which much may be expected is the huge rigid naval dirigible being constructed at Barrow; it is after the Zeppelin type and will carry six-cylinder Wolseley-Siddeley engines, developing several hundred horse-power. England also has two other small dirigibles for scouting purposes.

If reference is only made in the foregoing to lighter-than-air craft, it is because a deficiency in military aeroplanes can be remedied with comparative rapidity, especially in a country which produces such machines as Wright and Curtiss biplanes.

The point which it is necessary to make clear is that the country which establishes a lead in military dirigibles, will have a very real advantage over others, and one which it will take considerable time to overcome. Why it is that this is not generally recognized in Washington and that the usefulness of the dirigible of the latest type as an engine of war, is either not known or appreciated, is not obvious, but it is probably because all dirigibles are judged by those seen in this country.

If this is so, it is a very natural thing that Congress should not wish to spend money in acquiring any.

It cannot be asserted too vehemently that to compare the little one-man or two-man "dirigibles," as the lemon-shaped gas-bags seen here at fairs and festivals are called, to such ships of the air as those designed by Count von Zeppelin or Major von Parseval, is like comparing a little harbor-tug to an ocean liner;—one cannot expect the former to be of any military use, any more than one can expect the tug to cross the Atlantic.

For a dirigible to be of any utility it has got to be large, and the reason for this cannot be set forth more clearly than it was recently by Mr. Carl Dienstbach, whose competency in the matter, it is presumed, no one will deny. He said recently in an article which should have received considerably more notice than it did:

> "Airships are subject to a natural law that exacts gigantic sizes in return for the advantages which make them factors in fighting. The law is fundamental and asserts that the surface of a body grows as the square of its linear dimensions—length by width—and the space it occupies as their cube—length by width by depth. As the weight of an airship is represented by surface, while its lifting power depends on its cubic dimensions, the latter's preponderance over the weight grows constantly with any increase in size.
>
> "In consequence, there has been a steady growth of dimensions in the construction of airships. The same fact is even more significantly emphasized by the most modern ships on the water, the law holding good in that element exactly as it does in the air."

That the lone American Army dirigible,—which is about thirty times smaller than the Zeppelin now building and thirty times less powerful than the English naval dirigible in course of construction,—attained a speed of close on twenty miles an hour and made a good flight of two hours in duration, in its trials, shows clearly what might be expected of the collaboration of such men as Captain Thomas A. Baldwin and Glenn H. Curtiss should they be given the chance to build a warship of the air worthy of flying the Stars and Stripes.

The two hour flight of the Signal Corps Dirigible No. 1 is probably just as meritorious a performance as the Zeppelin II's continuous air-trip of thirty-eight hours.

The talent is not lacking—but the wherewithal to devote it to good purpose, is most conspicuous by its absence.

The whole question being one of cost it is of interest to note what a comparatively trivial amount it would be necessary to appropriate to give the United States the position it should hold in military aeronautics.

Should one submarine more or less be asked for of Congress in the naval estimates, it would pass practically unnoticed by the majority, and it seems only sensible that it should, for after all the cost of a submarine does not represent the seventieth part of that of a modern battleship, and is a small item in the budget of such a power as the United States. Yet for the single price of one of these little craft, which by the way are almost, if not quite as much in the experimental stage as the best dirigibles, *two* magnificent "Parsevals" could be built, ships capable of sailing a mile high, at well over thirty miles an hour, and of carrying up a crew of a dozen or more experts. The comparison with a submarine is the one which immediately suggests itself because, being both immersed in the fluid they travel in, the dirigible and the submarine present great analogies of principle and are in fact, the exact counterpart of each other in relation to air and water.

A Zeppelin (the most expensive of all air-craft) could be built for the price of a torpedo-boat-destroyer—a single unit of the mosquito fleet—and for that of an ordinary cruiser a whole fleet of ships could be put into the air, ships the utility of which as scouts has already been proven, and the power of which as agents of destruction is full of the most pregnant possibilities.

An air-fleet at this time seems more appropriated to land warfare and there seems no immediate likelihood of its being capable of destroying a naval one, but should such a capability develop in the future, it is interesting to note the difference in the initial cost between the destroyed and the destroyer as judged by the cost of construction prevailing to-day.

For the price of a single battleship of the "fourteen inch gun" super-Dreadnought class now proposed, and taking the generally quoted figure of sixteen million dollars, it would be possible to purchase either sixty Zeppelins, one hundred and ninety-five Parsevals, two hundred and sixty "Libertés" and, if aeroplanes are considered, considerably over two thousand Wright biplanes, or ten thousand Santos-Dumont "Dragon-flies"!

Of course, hangars or sheds for dirigibles are extremely expensive constructions, but they are permanent acquisitions in the same way as naval dry-docks are; and it is not proven that it will be always considered necessary to "house" the big gas-bags any more than it is to put ships under cover.

There is just one more point which way be worth touching on.

Both regret and indignation have often been expressed that whenever a new triumph of science has opened up to man virgin fields of action or endeavor, its first application to human uses has invariably been a test as to its efficiency to help, facilitate and further the butchering of man by man: It would be very specious to argue along this line as regards aeronautics, and it is only too obvious that the deadlier its uses in war were proved to be, the quicker it would be availed of, but the opportunity may well be chosen to point out that it is as weapons become more deadly that war becomes less possible, and a suggestion that its absolute impossibility may be brought about with comparative rapidity through the frightful potency and destruction of aerial warfare, is not so far-fetched and utopian as it would appear to those who have not given thought to the matter.

That man will only stop "playing at soldiers" when it has become too dangerous for him, is perhaps not the way one would like to think of the final adoption of peace by him, but the childishly illogical game of war which humanity is indulging in in its youth will, without doubt, receive an earlier termination through the stern veto of appalling destruction than through the "grown up" logic of disarmament.

In the meanwhile, "si vis pacem, para bellum."

BALANCING

By Edward H. Young

BALANCING is the art of keeping an aeroplane horizontal as to its axis and in the direction it is desired to take. This involves the consideration of two equilibriums—the fore-and-aft and the side-to-side balances. Let us go back to nature for a base and take as our example the pigeon. Stretch its wings out straight from side to side as though the bird were in flight, and then draw an imaginary line through the wings from tip-to-tip. This shows the side-to-side balancing axis of the pigeon while in flight. If a gust of wind should hit one wing, it throws the front edge of that wing downward and the front edge of the opposite wing upward, thus preserving the side-to-side balance. These wings also act in the same capacity as do the front rudders on the Wright Brothers' aeroplane, that is, as elevating rudders. When the bird wishes to rise into the air, it throws its wing-tips a little to the forward of its true axis of side-to-side equilibrium. This has the effect of making the head portion of the pigeon's body lighter than the tail portion, causing the axis of the body of the bird to slope slightly into the wind and thus allowing the bird to rise into the air. The reverse of this takes place when the pigeon desires to diminish its altitude, that is, to come down. If a pigeon on the point of landing be carefully observed, it will be seen that, as it nears the ground, it takes a glide, rapid at first, then slower, as the ground is reached, until just before the stop is made, it beats its wings rapidly two or three times (with the wing-tips a little in front of the side axis), so that it stops short, with its body at an angle of about forty-five degrees to the ground before finally landing.

If a careful observation be made, it will be seen that the pigeon's wings are absolutely horizontal to the body, when the landing glide is commenced, that is, while the pigeon is still in swift motion. As the speed is lessened, the wings are thrown back, forming more and more a dihedral angle, the bird thereby obtaining an automatic equilibrium device (for it is well-known that dihedral angles at slow speeds tend to give automatic equilibrium).

Again it might be noticed, if watched carefully, that the pigeon's tail acts in a double capacity: as a rudder or as an assistant to the body and wings in compressing the volume of air underneath. Contrary to general opinion the tail is more often used to help compress the air than it is used as a rudder. That is, if the pigeon desires to rise, the tail is thrown underneath, so as to act as a counter-check to too great a forward rise of the body of the bird. If the bird desires to diminish its altitude, the tail is thrown above the line of the body. There is one exception to this rule, and that is when the bird desires to alight, as aforementioned. The wings by their shape and their ability to flap, play a two-fold part in the flight of the pigeon. By their curved shape they are enabled to compress the air under them and thus sustain the pigeon, while making gliding flights, and by their ability to flap they are enabled to compress the air under them to give the pigeon an upward momentum. Then, before the momentum is lost, the wings recover, obtain a new grip on fresh air, and the operation is repeated.

Summing up, we find that the wings of the pigeon play a three-fold part as carriers, as rudders, and as balancers, while the tail plays a two-fold part, as air-compressor and as rudder. These two appendages must, therefore, act in an inter-relational part. When the wings are acting as carriers, that is, compressing the air under them, the tail is acting as a rudder; when the tail is acting as a compresser, the wings are acting as balancers; the tail may also be said to act as a balancer, when the wings are acting as rudders.

Thus we see that two things (tail and wings) acting in concert, give a four-fold result—carriers, compressers, rudders, and balancers. In an aeroplane the best that man has been able to devise is to get these four results by means of four parts, front rudders, rear rudders, carrying surfaces, and warping wing-tips, all made independently and only acting in concert by the operation of the aviator. When man can come abreast of nature in the make-up of his aeroplane parts, then will the present-day aeroplane be only a matter of history.

In the best made-up aeroplanes of to-day the following operations are necessary to go through with to keep a proper balance. The curving of the carrying surfaces so as to lift, the raising or lowering of the horizontal rudders so as to go to a higher or lower level, the turning of the vertical rudders to the right or left so that a turn can be made in flight, and the warping of the carrying surfaces at their ends or lowering of supplementary wing-tips, if these are used, so as to maintain the side-to-side balance of the machine, while in flight.

These four operations have to be brought about by the aviator, each by independent means; so far only one inter-relational act has been achieved and this is the warping of the ends of the carrying surfaces or turning of the wing-tips to the proper angle, in conjunction with the turning of the rear rudders. This is for the purpose of "banking" the machine, when a turn is desired from the line of flight, thus keeping the machine to the proper angle of balance.

Expressed in concrete form, the prospective aeroplane inventor has three balances to watch out for and provide for by three operations, the fore-and-aft balance of the entire machine; the side-to-side balance of the entire machine; and the centrifugal balance (or the angle balance), which the aeroplane must of necessity assume when making a curve, or when a sudden gust of wind hits one side of the machine.

The object of the aeroplane of the future will be to obtain all of these results and yet to cut out some of the rudders or levers. This will probably be done by some invention whereby the carrying surfaces can be flexed the same as are the wings of a bird. When this is done the front horizontal rudder can be placed in the rear to act in the same capacity as a bird's tail and the rear vertical rudder and wing-tipping devices can be done away with.

All of the axes of the balances must cross at some point. At this point must be placed the engine and operator, the weights of which must be balanced against each other as to the true centre of the aeroplane while in flight. This has the effect of keeping the dead weight of the aeroplane always as a true base from which to gauge the working of the machine by its balances.

If the machine which you are building has no provision for taking care of these three lines or axes of balance, you can rest assured that your machine will never make a successful flight until this vital defect is corrected. Then you will have a practical machine, and when you invent a device or devices, which control these balances by a smaller number of levers or parts than heretofore used, you will then have made a decided improvement and have benefited both yourself and the art in a very substantial degree.

A LETTER FROM CLÉMENT ADER

WE were, on April the second, placed in possession of the following correspondence by Mr. Israel Ludlow, Associate Counsel for Louis Paulhan in the Wright-Paulhan lawsuit.

We need hardly dwell on the superlative interest which a communication from that almost mythical figure, Clément Ader, presents at this time.

When future historians write of the first timid successes of man in the Art of Mechanical Flight, two men will stand out above their fellows as giant forerunners on the path of Progress: their names are Wilbur Wright, the first man to fly (if by fly is meant to pilot and control a heavier-than-air craft in the atmosphere) and Clément Ader, the man who, thirteen years before and many years before the perfection of the gasoline engine, tore himself free from the ground for a few brief moments, in a steam-driven, bat-shaped machine of his own design. These two men who will later be put side by side on the pedestals of Fame are at present in conflict over the degree of priority which should be attributed to each.

For some years past, Ader has been urged to let the world know what he thought of the "coming true" of his dream of many years before—a dream of his so often derided. But until this time he has kept silent, and it is the simple statement of an actual fact that this is the first communication from Clément Ader to appear in print since dynamic flight has been proved to be possible; this applies to publications in Ader's own country or in any other country as well as in this one.

AIRCRAFT is glad to offer to its readers this first communication from the pen of the great Frenchman whose dignified and somewhat pathetic figure has so far loomed dimly mysterious to students of aeronautics, but who now comes forward with some of his old fire to reveal to the world that the name of Ader does not represent a myth or a legend, but a vital individuality.

2688 Broadway,
New York, February 21, 1910.

Clément Ader, Esq.,
Aero Club of France,
Paris, France.

Dear Sir:

Mr. Wilbur Wright makes the following statements in his affidavit, introduced in the suit of the Wright Company vs. Louis Paulhan, now on trial in the United States Courts for infringement of patents:

> I. "Mr. Ader, after expending about $100,000, which was advanced by the French Government, discontinued experimenting in 1897 because the French Government, after a practical trial of the machine, pronounced its equilibrium hopeless, and refused further to advance funds. It has been claimed by the defense that this machine made short flights but one of the officers, who was present in his official capacity at the trial of this machine, stated to me that at the instant it tried to leave the ground, it rolled over and was broken without any appreciable flight."

Referring to the French Illustrated Quarterly Publication: "Revue de l' Aéronautique théorique et appliquée" of October, 1893, Mr. Wright stated:

> II. "The description is not complete and only a trifling examination of the description is needed to show that while scores of different parts are to be moved, no means is described by which an operator could obtain so many independent movements. The description does not furnish sufficient data for the construction and operation of the machine and, as already stated, all attempts to operate it resulted in utter failure, although the French Government spent about $100,000 in such attempts. Most thorough, practical demonstrations carried on at enormous expense demonstrated the inoperability of the machine."

III. "The translation of the Ader article offered by the defense does not seem to me to convey a correct idea in some respects and particularly in describing the bending upward and downward of the fore-arms, the translation is very much at fault. The French word 'gauchir' is translated on page 10 line 5 by the expression 'to warp,' and again on page 11 line 7 it is translated 'warping,' although so far as the construction of the machine is apparent, the word 'bend' or 'bending' would seem to better express the idea in the detailed drawing representing the mechanism for producing this result. The forearms seem to be joined to the arm by gimbel joints so as to bend forward and backward or up and down. The tendons T and auxiliary muscle m prevent the arms from bending upward under the sudden strain, while the tendon c which is above the elbow keeps them from bending down. As the forearms, right and left, are interconnected, when one goes up the other goes down but this does not give them different angles of incidence."

IV. "It is further noted that on page 6 paragraph 4, a tail is not included among the features which are asserted to be essential, and in the third line of the last paragraph of page 7, it is said: 'When the aeroplane has a vertical rudder, it is fixed,' etc., therefore I conclude that the author did not consider a vertical tail an essential part of the apparatus. It is nowhere disclosed that lateral equilibrium could be controlled by setting the right wing tip at a different angle from the left and correcting differences in horizontal resistance between them when so adjusted by turning to the wind that side of a vertical tail which is toward the wing having the smaller angle of incidence. It has been asserted in some of the affidavits that this apparatus is said to have made short flights at a subsequent period, but I state that in 1906, an officer officially representing the French Government, in a negotiation with my brother and myself, personally told us that he had been present in his official capacity at the later trial of the apparatus, and that at the instant it attempted to leave the ground it lost its equilibrium and was broken without having attained any appreciable flight."

> "In conclusion I state that the illustrations and descriptions are too incomplete to enable anyone to construct such a machine, and no explanations of the purposes and plans of operation of various parts are set forth in such a form as to enable any man to understand how to control equilibrium with the device described."

I would be pleased to have a statement from you on the subject. I cannot believe that Mr. Wright has correctly stated the situation. Your statement would be very valuable to a clear understanding of the situation, and might be of considerable aid to Mr. Paulhan.

Very respectfully yours,
Israel Ludlow.

Château of Ribonnet,
Beaumont on Lèze (Haute Garonne).
April 2, 1910.

Mr. Israel Ludlow, Attorney,
2688 Broadway, New York, U. S. A.

Dear Sir:

Here is my reply, paragraph by paragraph, on the subject concerning which you wrote me in your letter of February 21, 1910.

I. The testimony of Mr. Wilbur Wright concerning the attitude of our government towards my military aviation trials in 1897, is of the most fanciful kind; what is certain, is that he knows nothing about it. The Minister of War did not at any time condemn my work; on the contrary he constantly recognized its full value. It is apparent from our correspondence that it is to the deep unrest in France at that time, that the responsibility of this abandonment must be attributed. I consider that the erroneous assertion of your adversary is a very discourteous one for our government. It is absolutely false that the French officer to whom Mr. Wright refers, officially witnessed the trials of 1897, and therefore that he could have given him an account of them. I cannot possibly admit that a French officer can have unduly invested himself with a mission with which his superiors had never entrusted him. I prefer to believe that Mr. Wright made a mistake, or that he imagined the argument for the purposes of his case.

II. I in no way collaborated to the *Review* to which you draw my attention; its Editor drew from my patents all the notes he published, and although they are not complete, the descriptive article, such as it is, appears to me to be entirely sufficient for the defense of your client. The depreciation which your adversary makes of it is not sincere; it is only there to serve his interests. The persistence of Mr. Wright, in constantly bringing in our government, in a lawsuit which in no way concerns it, is a lack of tact.

III. In the third paragraph, as well as in the beginning of the fourth, I only find dissertations of no importance, based on some subtilities of translation and badly interpreted descriptions, touching in no way on the question of the principle of flight. Your adversary affects to ignore the value of my work; there are two things, however, patented twenty years ago which belong to me and which he understands to perfection: they are the warping, which he has used for some years, and the curve of sustentation which he has recently adopted; for Mr. Wright came to France with flat surfaces, flying badly; and went back with curved surfaces, flying better.

IV. It is in a state of indignation that I complete the perusal of the fourth paragraph. For the second time your adversary maintains that he has received confidences from a French officer having officially witnessed my trials. This declaration is evidently repeated, with malicious intent, and the more odious as it is of no utility to his case. I repeat anew: it is false. You can declare before the Court of the United States that in the body of French officers, none could have so forgotten himself as to outrage truth.

After having carefully examined the declarations and testimony made by Mr. Wright in the suit he is waging against Paulhan, in the part which concerns me, my conclusion is that they are stained with falsity and, consequently, should remain void.

Signed at Ribonnet, C. L. Ader.
March 21, 1910.

THE LAW OF THE AIR

By Denys P. Myers

Continued from April Aircraft.

THE AIR AND THE EARTH

STATE jurisdiction over aerial craft has been defined as valid so far up as force may be exerted, and a distinction has been drawn between the vehicle when owned by an individual and when devoted to the public service. These questions have been viewed from the standpoint of the aviator or aeronaut; but what of the man beneath?

Owners of property in their individual capacity, corporate municipalities and federal states, as opposed to legally sovereign states or nations, will have many interests in flying men. In short, what changes will the Conquest of the Air effect on municipal, as compared with international law?

Here there is practically no question of an isolated zone, for the necessity of preventing espionage does not exist. Aviators and aeronauts traveling over their own federal states or their own national territory will wish to go high or low, as fancy demands. Aviators, particularly, will probably select a level just high enough to avoid conflicting eddies from chimneys, trees and such things. They would then be easily within the power of a property owner's gun. Has the latter any excuse for practising the pure cussedness of his temperament upon the flier? It seems both safe and proper to answer: No.

To my mind, there is no doubt but that the dictum that "the air is free" will prevail. Scientifically, the dictum means nothing more than an attitude for approaching the subject. That is, the law will contemplate aerial matters from the point of view of setting up only the restrictions necessary to preserve rights and to meet the ends of justice, as well as placing states in the way of adequately protecting themselves.

From this basis of theory, then, look at the individual's rights in the air and the landsman's rights as against the aeronaut. It is evident that flying man has no absolute right to pass over the property of another, any more than he has to hold a weight above the head of another. A potential element of trespass and injury exists in either case. At any time, the aeronaut may have to discharge ballast, fly low or even land. The noise of his engine may disturb the inhabitants beneath. Other inconveniences are conceivable. Therefore, it seems necessary that aeronauts and aviators shall operate only under license or franchise, emanating from the federal state or national government, or both.

Such a document, by reason of the terms under which it is issued, will clear up many ticklish questions. It can define the rights of the aerial traveler, thus protecting him from adverse claims of private rights; and it can formulate the extent of the landowner's interest, thus indicating to how great an extent the public authority expropriates his tangent atmosphere for the benefit of the public. The question of license or franchise to aviators and aeronauts should be the first piece of legislation on aerial matters considered, and the law should be very carefully framed.

Some progress has already been made in projecting aerial transportation companies, and a German firm intends to give a regular service out of Munich this summer. Regular trips, for instance, are planned to Oberammergau. Presumably a route through the air-space quite as definite as the lanes of ocean commerce will be followed. A number of landholders will in this case witness the snatching away from them of the use of a portion of their freehold for which they have themselves no use, but the periodical tenanting of which by an airship would probably affect their peace and place their property in potential jeopardy.

The periodicity of such air travel injects another element into the problem. It is certainly reasonable to conclude that the landowner should have some say as to the terms under which his air-space is regularly employed for traffic of a commercial nature. If, however, the dirigible maintains a height sufficient to avoid becoming a nuisance and works no actual damage, its passage will be protected by Art. 905 of the Imperial Code of 1900, specially intended to affect aeronautics, which says:

> "The right of the owner of a piece of land extends to the space above the surface and to the substance of the earth beneath the surface. The owner may not, however, forbid interference which takes place at such a height or depth that he has no interest in its prevention."

The new Swiss Code, section 667, repeats this same provision, and France is, I understand, intending to exact the same principle. Other states will doubtless follow suit.

This is only half of the question, however, for a corporation periodically breaking the close of a freehold even so tenuously as by traversing the air-space above it, thereby sets up a prescriptive right to the use of the atmosphere. Municipal law must therefore tackle this problem, and fix the relations that will maintain between property owner and aeronaut or aviator. The subject is one for statutory regulation, and as the passage of a railroad through an estate is the nearest analogy, the question will doubtless be settled along the lines followed for that form of transportation.

Landing involves other difficulties. In 1904 a balloon named "La Touriste" descended in a little street near the Bastille, in Paris, and an explosion ensued, killing one man and injuring several others. The courts held the pilot responsible. In Belgium during 1909 an aeronaut saw that his balloon was becoming deflated; he alighted in the street of a little town just where a citizen was striking a match to light a cigarette at the moment. Other citizens, thinking to be serviceable, caught the drag-ropes and hauled the balloon down; the lighted match and the escaping gas produced an explosion which killed several. "The aeronaut was held responsible," says Paul Matter in *La Revue Bleue*, "on the ground that he had created a danger, but the question was very delicate, for others had meddled with him."

The case of Wing vs. London General Omnibus Co. (Law Journal, Vol. XLIV, 460) is a straw which shows the probable trend of Anglo-American decisions when machines are forced to land in unexpected places. The owner of a taxicab was using it with all due skill on a slippery road when it skidded and collided with a person on the sidewalk. This person brought suit. The jury found that a motor vehicle is liable on such a road to become uncontrollable, and did in fact become so, and that the owner was negligent in sending it out for use there under such circumstances. Judgment was accordingly entered for the defendant, and a reversal was itself reversed and the original judgment supported by the court of appeal.

Gravity's insistent force puts the air into about the same category as a slippery road so far as uncertainty of keeping to the track is concerned. So long as the air-craft remains in the atmosphere, the common law remedy against its invasion is by a form of suit known as a trespass on the case which can be brought wherever the defendant can be served with process. Thus is the way made easy for Justice Morris Kammelhor of Cedar Grove, N. J., to prosecute those who contemn his trespass notice.

The remedy at law when the air-craft descends to earth is different and based on the common law principle *quare clausum fregit* (because he broke the close). An aviator who lit upon a farm in Massachusetts could be sued under this principle only in that state, whether the proceeding were in the state or Federal courts. His vehicle could not be seized on *in rem* process issuing from either court, under existing law. However, a statute enacted by the state authorizing such a suit to recover damages by seizure of the machine would justify the proceeding, so long as Congress had not acted on the matter. A federal statute would, of course, affect voyages only from one state into another, and could grant a remedy by attachment. In the absence of such legislation, the redress of the landowner would often prove illusory, especially in the case where the machine descends, comes into sudden contact with earth or buildings and then as quickly rises.

Such an incident and cognate occurrences might produce difficulties more complicated than heretofore encountered. As mentioned before, all flight is in defiance of gravity and therefore temporary mishaps are bound to be more frequent than in the case of the automobilist. This is reason enough for establishing a series of flags and means of identification, but it also seems likely that the circumstance will bring up discussion as to whether there shall not be attached to the aeronaut's license a form of indemnatory bond, against which minor claims, especially those not warranting a full-fledged suit, may be filed. A blanket policy of accident insurance covering all injuries occasioned by the use of air-craft and payable to the injured upon judicial determination of a claim would accomplish the same result.

The other side of these questions also compels attention. Necessarily the majority of the considerations center around the air-craft pilot and consist of defining his duties, rights and privileges; but some changes will be brought about on the earth by reason of the navigation of the air. A few of these are hinted at in a proposal made by the Aero Club of France, doubtless working on the suggestion of a national association of such eminent lawyers as MM. Rambaud, Malepeyre, Louis Renault, Delayen, d'Hooghe and Talamon for the purpose of establishing an aerial legal code. By this proposal the French Minister of Public Works is asked to recommend legislation as follows:

> "Owners of high buildings must illuminate every 150 feet of their structures. Electric wires and cables more than 90 feet above the ground must be provided with small white pennons at intervals of 360 feet by day and white lights at night."

The same proposal asks that no aeroplane or dirigible shall circulate above enclosed property at less than 1,500 feet nor remain stationary at less than that height; they shall not fly over towns except with the special permission of the authorities. The cities and the state itself will also have additional duties to perform.

Due to the absence of solar radiation and of the numerous air-currents daily life sets up, the pilot of an air-craft finds traveling at night safer and easier than in the daytime. Reasonable safety in flight consequently will bring forth many arguments as to why towns, cities and states will have to provide systems of lights for the benefit of the users of the air. The counterpart of marine lighthouses will be needed, distinguishable landing stages will be demanded and proper indication of dangerous vicinities—such as those wherein are situated numerous factories or where the district itself makes possible landing hazardous—will be asked.

In fact, the problems that arise are only bounded by the limits of civilized relations. In time, practically every case that has come to bar as regards land or marine transportation will be considered as of the air. But most of these will be easily solved on the foundations at present existing; while the above considerations, in some measure, involve new features peculiar to aerial traffic.

To be continued in June AIRCRAFT.

Owing to the receipt of matter of more immediate interest, the continuation of "The Internal Work of the Wind," by S. P. Langley, has been postponed until next month's issue

Look for the June AIRCRAFT. It will be quite beyond comparison with any previous aeronautic literature

FOREIGN NEWS

By Albert C. Triaca

Algeria

A great reception was tendered Métrot on his return to Algiers from Egypt, where he shared the honors and prizes of the Heliopolis meet with Rougier.

Except for a day or so of practice in France Metrot has never flown above any soil but that of Africa.

Argentine Republic

It is expected that during the coming Exposition at Buenos-Ayres, a dirigible of the rigid type of 4,500 cubic metres will be seen cruising above the city; the builder is Mr. Sanchez, who has been making extensive purchases for the purpose in Paris. The motor will be a Panhard.

Panzelli, the Italian aviator, recently sustained a fall when flying near Buenos-Ayres, but escaped injury.

Bregi and Stoeckel have been continuing their demonstrations and have made several long flights on their Voisins.

Aubrun, on his Blériot, flew recently ten miles out into the country carrying his rifle; he then landed, shot several hares and returned to the aerodrome with his booty, thus emulating Latham's feat of last November.

At Rosario, Valleton has been flying on a Farman.

Thus the Argentines have recently been treated to exhibitions by five of Europe's flyers.

Austria

The military authorities have decided to acquire several aeroplanes. They have already decided that one or several of these shall be Farman biplanes.

The latest recruit to the ranks of Austrian aviators is Hyeronimus, the famous driver of Mercedes racing cars. He has already flown in Germany on his Blériot, and is about to fly in his own country.

Belgium

"Major" Taylor, the colored American wheelman, familiar to frequenters of European velodromes, is having a monoplane constructed at Liege, where he has recently been living. It is being built entirely according to his own ideas.

The following are also to fly shortly at Liege: Lanser, de Lamine, Allard, Baar, Frasenster, Kinet, de Petrowski.

Probably the most important dirigible contests ever held in the world will take place at Brussels, during the Exposition. The huge gas-bags will be divided in two classes. Among the larger are entered the "Belgique," of 4,000 cubic metres; the "Ville de Bruxelles," 6,500 c. m., and a Parseval of 5,000 c. m.; among the smaller ones, a Zodiac of 1,400 c. m.; an Astra of 1,500 c. m., and the new little Parseval V of 1,200 c. m.

Canada

McCurdy's latest exploit at Baddeck was a flight of half an hour on his speedy biplane.

China

Whereas the Aryan civilization all over the world is, after thirteen decades of familiarity with the balloon, turning its attention to heavier-than-air machines, the Chinese who, many centuries ago, invented the first of all air-craft, the kite, are now turning their attention to the lighter-than-air school in aeronautics.

Twenty years ago the experiments made with captive balloons by the French engineers Yon and Godard filled the Celestials with terror, ten years ago they realized the usefulness of military aerostats when they observed their role in the Boxer campaign, and now they are investigating the various systems of European Army dirigibles and, according to the Yuang Tong Pao, are about to invest in several for their army.

Denmark

Our attention is drawn by Danish friends to the fact that the first aviation meet of the year was not that of Los Angeles, for in the first days of 1910 an aerial tournament of no small merit took place in Copenhagen. The main competitors were Christiansen and Svendsen on Voisin biplanes and Thory on a Blériot monoplane.

England

All England is once more looking forward to the coming of the Bayard-Clément II. The Paris-London voyage of the great dirigible, after being put off until after the elections, has been further delayed by the damages wrought in the recent French floods. It now appears, however, to be imminent.

Fine flights have recently been made by Maurice Egerton, Ogilvie, Rolls, Rawlinson and Moore-Brabazon. The competition to represent the United Kingdom in the Gordon-Bennett Cup promises to be very keen this year.

The second British Aero Show closed at Olympia, Saturday, March 19. Merely to glance through the list of exhibitors is to feel a deep sense of the enormous possibilities that lie ahead along the path of flight. To find in the list of aeroplanes alone over a score of different names is to realize—perhaps for the first time on the part of those who have been inclined to look upon the whole subject of aviation as being altogether "in the air"—that the manufacture of flying machines is already an established business in Britain.

Firms like Short Bros., Handley Page and Howard Wright, who exhibited flying machines at the first Aero Show, are now surrounded by quite a crowd of new-comers, among whom are some well-known firms from the automobile industry like the Humber and Star Companies.

Inseparably a part of the aeroplane industry is the manufacture of suitable engines, and whether this is or is not ultimately carried on by the same firms that build the remainder of the flying machine is of relatively little significance compared with the importance of the fact that it must ever be a section of the work under any circumstances.

A lecture on aviation was recently given by Lieutenant-Colonel G. Espitallier at the Cralton Galleries, London, under the auspices of the Alliance Franco-Britannique.

A huge new spherical balloon of a capacity of 163,866 cubic ft. (68 ft. diameter) has recently been built by the Daily Graphic with the object of again assailing the long-distance record.

Mr. S. F. Cody is now at work on a new biplane, on the lines of his first, but 4 ft. less in the spread of each wing. This will be fitted with a twelve-cylinder 100-h. p. rotary Phœnix engine, and it is designed to fly at a speed of over 60 miles per hour. He hopes to give a series of exhibition flights in England during the year, and has had some very tempting offers to induce him to go and fly at various of the important Continental meetings.

Analysis of Aeroplanes at Olympia.

Name.	Type.	Spread of Wing.	Depth of Wing.	Rudder.	Elevator.	Tail.	Length.	Surface.	Weight.	H.P.	Propeller Diameter.	Propeller Pitch.	R.P.M.
								sq. ft.	lbs.				
Avis	Mono	26'	6' 4"	14 sq. ft. and 22 sq. ft. (Cruciform and of irregular shape)		None	27'	160	430	35	(T) 6' 0"	2' 3"	1,200
Blériot Type XI.	Mono	25'	6' 7"	2' 0"×2' 6"	5' 0"×2' 0" (one each end of tail)	12' 0"×2' 0"	26'	166	460	25	(T) 6' 6"	2' 0"	1,200
Demoiselle (Dutheil Chalmers)	Mono	21'	6' 0"	6 sq. ft. and 19 sq. ft. (Cruciform and of irregular shape)		None	22'	186	320	35	(T) 6' 6"	3' 6"	1,200
Demoiselle (Clément)	Mono	18'	6' 10"	13 sq. ft. and 18 sq. ft. (Cruciform and of irregular shape)		None	20'	108	220	30	(T) 6' 6"	2 3"	1,200
Demoiselle (Mann & Overton)	Mono	20'	6' 6"	10½ sq. ft. and 16 sq. ft. (Cruciform and of irregular shape)		None	20'	133	340	30	(T) 6' 6"	2' 6"	1,400
Farman ...	Bi (b)	33'	6' 6"	4' 0"×4' 3"	9' 0"×2' 0" (front) 7' 0"×2' 6" (back)	6' 6"×6' 0" (biplane)	39'	476	1050	40	(P) 6' 7"	-	1,000
G. and J. ...	Bi (c)	30'	5' 0"	3' 0"×4' 0"	12' 0"×3' 0"	10' 0"×5' 0" (monoplane)	31'	486	660	60	(P) 9' 0"	10' 0"	600
Grégoire-Gyp	Mono	34'	7' 4"	*4½ sq. ft.	10 sq. ft. (triangular)	78 sq. ft. as empennage 9' 6" long	34'	377	800	30-40	(T) 7' 0"	-	1,000
Humber (Le Blon)	Mono	30'	6' 6"	3' 0"×3' 0"	3' 0"×2' 0" (one each end of tail)	6' 0"×2' 0"	28'	166	400	30	(T) 6' 0"	3' 6"	1,200
Humber Biplane	Bi	41' 6"	6' 0"	13 sq. ft. (of irregular shape)	32½ sq. ft.	6'×2' 3" as empennage	30'	463	not given	60	(T) 6' 6"	not given	1,300
Humber (Lovelace)	Mono	31' 3"	6' 9"	10½ sq. ft. (irregular shape)	32½ sq. ft. (irregular shape)	8' 0"×2' 3" each side as empennage	26' 6"	210	not given	50	(T) 7' 0"	-	1,300
Handley Page	Mono	30'	6' 0" tapering to point	7½ sq. ft. (triangular)	6 sq. ft. (triangular)	6 sq. ft. (triangular)	31'	150	250	20-25	(T) 6' 6"	not fixed	1,800
Howard-Wright	Mono	27'	6' 6"	3' 0"×2' 6"	3' 0"×3' 0" (at each end of tail)	6' 0"×3' 0"	26'	190	490	40-60	(T) 6' 3"	2' 8"	1,000
Lane (1 seat)	Mono	30'	6' 3"	2' 3"×2' 6"	3' 0"×4' 0" (2 above tail)	6' 6"×6' 0"	34'	205	400	30	(T) 6' 10"	2' 10"	1,350
Lane (2 seats)	Mono	36' 6"	6' 0"	3' 6"×2' 3"	6' 6"×3' 0"	10' 0"×3' 0"	34'	330	675	60	(T) 6' 6"	4' 6"	800
Mulliner ...	Mono	35'	6' 6"	3' 0"×2' 0" (approx.)	16 sq. ft. (triangular)	14 sq. ft. as empennage	27'	220	380	35-45	(T) 6' 3"	4' 6"	1,200
Ornis	Mono	20'	6' 0"	3' 2"×2' 0"	2' 0"×2' 0" (one each end of tail)	6' 0"×2' 0"	20'	170	500	25	(T) 5' 0"	3' 0"	1,200
Roe	Tri	20' or 26'	3' 6"	2' 4"×3' 0"	All planes act as elevators	6' 4"×3' 0" (triplane)	22'	230 or 280	400	35	(T) 6' 0"	3' 0"	1,200
Short-Wright	Bi (d)	40'	6' 6"	5' 4"×1' 7" (twin)	15' 0"×2' 0" (biplane)	None	27' 6"	500	885	30	(2P) 8' 6"	11' 9"	375
Short (Moore-Brabazon)	Bi (e)	45'	6' 7"	5' 0"×1' 6" (forward)	16' 0"×2' 9" (biplane)	4' 6"×7' 0" (vertical) 4' 6"×7' 0" (horizontal)	29' 6"	580	1200	60	(2P) 9' 0"	12' 0"	410
Short (new type)	Bi (f)	32'	5' 6"	5' 8"×1' 6" (forward)	10' 0"×2' 0" (biplane)	6' 0"×2' 0" (horizontal) 2' 0"×6' 0" (vertical)	30'	400	650	30	(P) 7' 6"	7' 6"	1,300
Sommer ...	Bi (g)	34'	6' 0"	2' 3"×2' 0" (twin)	13' 6"×2' 3"	10' 0"×6' 9" (monoplane)	35' 6"	336	700	50	(P) 8' 4"	not known	900
Spencer Stirling	Mono	34'	6' 0"	2' 10"×2' 0"	3' 6"×2' 9" (one each end of tail)	7' 0"×2' 0"	27'	210	660	70	(2T) 6' 0"	10' 0"	600
Star	Mono	42'	8' tapering to 6'	10 sq. ft. and 10 sq. ft. (of irregular shape)		30 sq. ft. as empennage	32'	280	750	40	(T) 6' 6"	3' 9"	1,400
Twining ...	Bi (h)	28'	4' 0"	2' 2"×1' 4" (twin forward)	10' 0"×3' 0" (monoplane)	None	14' 10"	277	440	20	(P) 6' 3"	4' 3"	1,000
Zodiac	Bi (a)	33' 3"	6' 6"	4' 6"×3' 3"	13' 0"×2' 6"	7' 6"×6' 6" (biplane)	30' 0"	333	1100	50-60	(P) 8' 0"	-	1,300

From the London "Aero."

On March 24 Rolls made a cross-country flight of twenty-eight miles on his Wright and reached a height of 1,000 feet, both performances being records for English aviators.

France

The crossing of the estuary of the Seine—from Havre to Trouville—is about to be undertaken by the well-known Havre aviator, Molon. The distance is about seven and a half miles and Molon expects to cross in twelve minutes on his Blériot. He has already made flights exceeding an hour in duration.

Paul Tissandier is now trying out at Pau a new Wright biplane, which can "lift" 300 lbs. besides himself—say fuel and lubricant for an eleven hour flight.

On March 12, Roger Sommer made a flight with a passenger of sixty-eight minutes on his new type of biplane.

The Comte de Lambert took M. Trouillot, the Minister of the Colonies, for a fine flight on March 16.

POSTER OF THE NICE MEET.

A BLÉRIOT SOARING ABOVE THE RIVIERA—LE PAYS DES ROSES. A GENUINE BIRD'S EYE VIEW!

The latest firm to undertake the building of aeroplanes is that of Tellier, the famous motor-boat builder.

The first monoplane turned out by him made a flight of forty minutes only five days after it was first taken in hand by the well-known sportsman Dubonnet.

M. Millerand, Minister of Public Works, has organized a commission of aerial navigation. This commission is composed of state officials and experts selected from the Aero Club. Their business is to establish laws which will govern all aviation throughout France.

On the other hand, M. Pichon, Minister of Foreign Affairs, has issued a call for an international conference in regard to the matter. The vastness of the heavens makes legislation difficult. What rules should regulate airships at the start? How should they be made to land? How are tariff questions to be settled? These and other such subjects will be discussed and, let us hope, settled by the international congress.

As France took the lead in automobiling from an industrial viewpoint, so she has been first in aerial navigation. It is therefore highly important that the first international congress should be held in Paris. M. Pichon foresees many difficulties with the English representatives. For, according to the law of England, the owner of land owns everything from the center of the earth right up to the heavens. This is the English landowner's heritage from feudalism. Hence, no matter how high the Wrights, Blériot or Paulhan may happen to fly, they will always be trespassers, when over English territory.

Professor Marchis began at the end of February his aeronautic lessons at the Faculty of Sciences, Paris. The course will consist of the seven following lessons: Balloon Statics; Resistance of the Air—Aeroplanes; Balloon Dynamics (Vertical and Horizontal Motions); Dirigibles; Stability and Direction of Aeroplanes; Motors; Propellers.

A MODERN AVIARY.

A GLIMPSE OF THE AERO SHOW AT OLYMPIA, LONDON.

Among the aviation experiments exciting a great deal of interest at present are those of César, at Issy-les-Moulineaux.

One reason for this is that César is a one-legged man. The spectacle of a man seeking to overcome a deficiency in limbs by the acquirement of wings is novel enough to attract attention of itself, but César's machine is itself of unusual design, being of the combination type (half balloon and half aeroplane).

No good has so far come of experiments along this line, but César has high hopes of succeeding where others failed. His machine has many novel features.

"A runaway aeroplane" is the way a recent mishap at Issy is described by our continental contemporaries.

The Blériot of Franchant, a beginner, got beyond his control, passed out of the grounds and landed in a bastion of the nearby fortifications. The machine was smashed, the aviator unhurt.

Henry Farman has certainly been having marvellous success at Mourmelon. His latest pupils, Efimoff, Van den Born, Chavés, Cammermann, Frey, Cruchon, flew after a few lessons as if to the manner born.

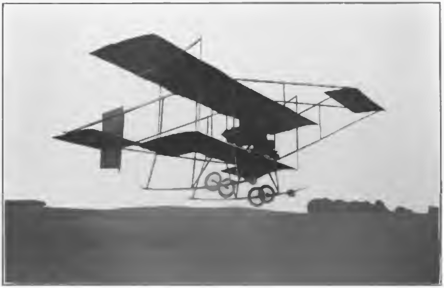
Van den Born, the old Belgian professional bicycle sprinter, has in particular done wonderfully well. He has been himself a teacher for some weeks now and recently taught four pupils in a single week a world's record in the development of human birds!

With the coming of spring, aviation meets are being organized all over the country.

Biarritz has secured Duray, Chavez, Bailly, Mignot and Leblanc.

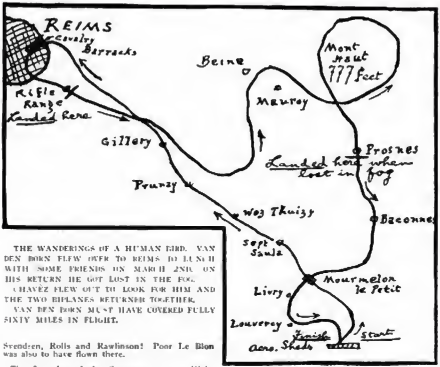
Niort will see de Lesseps, Busson, Campel, Dostel, Nyeman and Noel.

Nice is to witness an imposing array of famous flying men: Latham, Rougier, Grade, de Riemsdyk, Sand, M. Singer, Van den Born, Métrot, Duray, Efimoff, Chavéz, Olieslaegers,



THE NEW HENRY FARMAN BIPLANE DURING ITS RECENT FLIGHT OF ONE HOUR AND TWO MINUTES WITH FARMAN AND TWO PASSENGERS ABOARD (WORLD'S RECORD).

FARMAN IN FRONT, MR. HEWARTSON BEHIND HIM, MADAME FRANK NEAR THE ENGINE, WITH HER BACK TO HEWARTSON.



THE WANDERINGS OF A HUMAN BIRD. VAN DEN BORN FLEW OVER TO REIMS TO LUNCH WITH SOME FRIENDS ON MARCH 2ND. ON HIS RETURN HE GOT LOST IN THE FOG.

CHAVEZ FLEW OUT TO LOOK FOR HIM AND THE TWO BIPLANES RETURNED TOGETHER.

VAN DEN BORN MUST HAVE COVERED FULLY SIXTY MILES IN FLIGHT.

Svendsen, Rolls and Rawlinson! Poor Le Blon was also to have flown there.

The first day of the Cannes meet saw Weissembach, the Austrian, and Rigal, the ex-motor racing crack, come to grief. Others competing there are Bablot, Edmond and Molon, who are also old motor racers; Gaubert, Baratoux, Frey, de Virel, Braun, Sands, Crochon, Christiaens, Jullerot, Prince Popoff and Hesne.

At Marseilles, Rougier, Métrot, Van den Born, M. Singer, Bablot, Serailler, Blanc, Callas, Galullan, Nogués, Dufour, Astruc and Hauvette-Michelin are showing their skill.

The skies of Europe this summer will certainly be swarming with the big birds.

With the return of fine weather the already numerous aviation schools of France have resumed their courses of instruction. Aviation promises to grow more and more in favor as a fashionable pastime.

All constructors of flying machines are overwhelmed with orders, and Henry Farman, Louis Blériot, and other crack aviators have been obliged to appoint special men at high salaries to help them to teach the art of flying. Good air pilots quickly find employment, after graduating at the schools, in organizing and directing local aviation meetings and exhibitions. Every town in Europe of any importance is eager to have one of these in the course of the year.

The greatest number of aviators are being trained at the Chalons camp, the military drill ground at Issy-les-Moulineaux having proved rather too restricted in area. Several of Bleriot's novices, however, with limited means, continue to use it.

The immense camp at Chalons is probably the largest and finest training ground for aviators in Europe, and it is only three hours by rail, omnibus, or autocar from Paris. Henry Farman has a huge aeroplane factory at the Chalons camp with a score of garage sheds. Other constructors are fast developing large establishments in the vicinity.

Trouble has arisen between some of the aviators who are using the Chalons camp as a practice ground and the military authorities in charge of it. The aviators, it is said, have hampered the soldiery in their drilling and the General commanding has lately decreed some very strict regulations regarding flying machines, among other things forbidding excursions from the aerodrome over the adjoining country.

One of the immediate consequences of this difficulty is that Henry Farman is about to move his extensive aeroplane works and garage sheds to the historic plains in the middle of the old Beauce country south of Paris, and due west of Fontainebleau. The plains are about eighty miles in width and are perfectly suited to aviation trials.

The village of Mourmelon-le-Grand in the Chalons plains is reaping a harvest from the aviation furor, as most of the novices are lodged and fed there. It is rare to find at the crowded table of any one of the small hotels in the village three persons of the same nationality.

Not even excepting the French, few novices own the aeroplanes with which they practice, but they are the jockeys of small groups of sporting speculators who furnish the money that is necessary to launch them on their career. They are expected, in return, to win many rich prizes for the men who finance them.

The Committee for a memorial to Captain Ferber has decided to erect a monument on the spot near Boulogne-sur-Mer, where Ferber sustained his fatal accident, and a statue in the town itself of Boulogne.

A TANDEM BIPLANE.

ONE OF THE LATEST MACHINES AT MOURMELON.

Germany

After establishing a lead in the building of lighter-than-air craft, Germany is now taking up flying in earnest. Since his return from Heliopolis, Grade has been making some fine flights at Bork. Hintner is also at Bork, while Keidel, Dorner, and Thelan have been flying at Johannisthal, and Lange has been trying out a military aeroplane near Dresden.

Among the machines now quartered at Johannisthal are the ex-champion bicycle rider Robl's Morhost-Kiel aeroplane, Lieutenant Huth's Antoinette, which was recently driven by Brunhuber; Necker and Eyring's Wright biplanes, Cassirer's Farman, Aller's Deutschland Schoeneberg machine, and the personal conceptions of Trotka and Leutner, Sagert, Schuler, Poulain, Telchow, Neumann, Sohn, Hanuschke, Timm, Harlon, Herforth.

All these expect to take part in the great national and international contests to be held at Johannisthal in May.

The efforts of German inventors are being applied towards meeting the very stringent demands of the military authorities, who want a flying machine which can soar for a considerable time if the motor breaks down, and which can raise itself vertically from the ground.

A Hamburg designer claims to have a stabilisating surface which will answer the first purpose, while trials are at present being conducted with gyroplanes, and an aeroplane is to be built with two motors, one for the propeller and the other to run a gyroplane.

The German War Office has opened two interesting national competitions, one for aeroplane propellers and another for dirigible propellers.

At a meeting of the Zeppelin Arctic Expedition Committee presided over by H. R. H. Prince Henry of Prussia on the 5th inst., it was resolved to make a request to the German Government for the services of the Imperial exploration steamer "Poseidon" for ten or eleven weeks. The members of the expedition intend to start for Spitzbergen on July 1 and will then, by the aid of the "Poseidon," study the conditions for airship landing.

Two German engineers, Herr Brackleshurg and Herr Seigneux, have invented a new type of airship combining the lighter-than-air and heavier-than-air systems. The new vessel somewhat resembles a balloon of the Parseval type, but the cage, or hull, is detachable, and is, in itself, a complete flying machine.

The balloon portion of the vessel is two hundred feet long, with a diameter of thirty-five feet, divided into eight air-tight cells, while the "car" is a monoplane.

The Zeppelin now building—the Zeppelin V—will be made of aluminum once more, as the new metal which was to replace aluminum, and of which so much was hoped, has not come up to expectations after a series of most minute and expensive tests.

German East Africa

It is said Germany intends presenting a military dirigible to this colony; the type decided on has, however, not as yet been revealed.

Holland

A Nimegue inventor has built an aerocycle in which he has succeeded in lifting himself clear of the ground on several occasions. He claims one man-power is sufficient to fly if properly applied, but does not state how long he was capable of exerting sufficient strength to keep himself aloft.

Hungary

The latest Hungarian of note to take up aviation is M. Adorjan, the well-known motorist. His machine is a monoplane of his own construction.

India

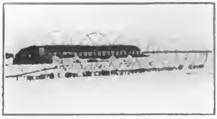
According to the Calcutta newspaper "Englishman," flights have been made near that city with a biplane of somewhat crude construction. A good deal of mystery surrounds them and further and definite information will be awaited with interest.

That the machine really exists, however, is apparent from the photograph we publish of it in its tropical-looking shed or hangar.

Italy

Nazarro perhaps the greatest automobile race driver ever known—is to become an aviator; he is to use a Voisin.

Lieutenants Calderara and Savoia have been making flights over the Centocelle plain, near Rome, on the Wright military aeroplane.



THE SKELETON OF THE ZEPPELIN V. THE BLACK SPECKS BENEATH IT ARE THE HUNDRED MEN WHO WERE CARRYING IT.

It is said that D'Annunzio, the poet and author, is about to take up flying. He is hesitating between a Voisin and a Blériot. D'Annunzio has recently written a book on the conquest of the air and has been lecturing on the new art.

Leonino de Zara recently made some excellent flights on his Voisin at Padua.

M. de Stephanis, the president of the committee of the aerial meet of Verona, is authority for the statement that at the coming meet at Verona the following aviators will appear: Latham, Farman, Rougier, de Lambert, Blériot, Balsan, Métrot, Van den Born, Chavéz, de Lesseps, Tissandier, Leblanc, Kuhler, Molon, Mme. de Laroche, Doray!

Truly a galaxy of stars to make Halley's comet pale in the limpid skies of Italy.

Among those taking part in the aviation meet at Florence (March 28 April 7) are Rougier, Guyot, Faccioli, de Zara, Cagno, Cobianchi, Grasso, Van den Born.

A new military dirigible of 4,600 cubic metres is being built in Rome; others of 8,000 and 12,000 c. m. are to be built for naval use.

AVIATION IN INDIA, A UNIQUE HANGAR.

Chevalier Vincenzo Florio has secured an aeroplane to compete in the Palermo aviation meet in May.

Cagno recently made a half hour flight on his A. V. I. S. biplane at Novara. This machine is a Voisin, built in Italy by the Atéliers Voisin Italie Septentrionale, the initials of which are utilized as the designation of the machine.

Japan

It is rumored that the Japanese military commission now in Europe is about to purchase several Wright biplanes mounted on wheels. These were experimented before them at Johannisthal, Germany.

It is hinted, however, that the commission while affecting to pay all its attention to aeroplanes, is really interested in the great German dirigibles.

Luxemburg

An aviation meet is being planned to take place at Mondorf-les-Bains; the date, May 15 to 23; the amount in prizes, $8,000.

Mexico

It is proposed to organize at Mexico an aviation meet at the time of the celebrationa of the centenary of Mexico's independence.

M. de Landa y Escadon, Governor of the District, and M. Maurice Raoul-Duval, the well-known sportsman and business man, have been discussing the question.

One hundred thousand dollars would, it is said, be given in prizes.

The meet would be given in November, firstly, because of the climatic conditions, and secondly, because the main contests in France, England and other European countries will by then be over and a great number of famous professionals free to make the trip.

Coming directly after the big races in the United States, the field should be most representative.

As is well known, M. Raoul-Duval recently imported a "Channel Crossing" Bleriot, and notwithstanding the great altitude of the capital and its environs succeeded in flying in the rarefied air.

The Mexican Government has given Señor Fredrico Cervantès, lieutenant of engineers, the mission of going to France to study the latest progress in aviation.

Monaco

ROUGIER'S GREAT FLIGHTS.

Probably no more interesting flights from a practical standpoint have as yet been made anywhere than those executed by Rougier on his Voisin biplane during his recent stay in the principality.

To those who know the "lay of the land" at Monte Carlo and Monaco, and the gusty landwinds which are rarely absent from the neighborhood, and which sweep down through the defiles and ravines in the mountainous region to the immediate north, it seems little short of marvellous that, at the present time, an aviator could accomplish day after day successful flights there, and only shows that the state of the art is rather underestimated than not by the average observer interested in it.

Every feature of these flights was fraught with apparent peril and suggestive of disaster; the getting under way in the narrow city street of La Condamine, the run on the encumbered quay, with the great Rock of Monaco rising on one side and a harbor full of shipping on the other, and especially the thirty-foot wall or breakwater running along the further end of the quay, against which the machine would crush itself into kindling wood were it not high enough up to clear it, rendered the start a perilous one indeed especially if the wind blew to the aviator's back.

Once the wall was cleared, Rougier found himself fifty or more feet above the rocky shore, and an instant later soaring over the Mediterranean.

Several flights were made for many miles over the sea, some as far as Cap Martin and Mentone. On his return Rougier would turn towards the land and, rising to a great height, go rushing far above the great crowds cheering him from every point of vantage in Monte Carlo.

It is little wonder that the gaming tables were deserted at such a time and that the feverish habitués of roulette and trente et quarante rushed out upon the already crowded terraces to see Rougier soaring over the famous Temple of Chance—on wings somewhat more reliable than those of the fickle Goddess of Fortune worshipped within.

Those who saw these flights will not readily forget them; with the lapis lazuli and sapphire of sky and sea mingling far to the south, the frowning cliffs of the Mont Agel and the Tete du Chien towering in the background, the white buildings, tropical gardens, fountains and monuments of the far-famed resort nestling at their foot, with the no less famous "Terrasses" a seething riot of color and animation, and above all —far above all—to the ceaseless clatter of its tireless engine and the whirring of its propeller, the great white bird cleaving the invisible atmosphere, with the small black figure representing its brain, crouching between its wings and acknowledging by gesture the noisy greeting and tribute faintly heard from below, the picture was a complete whole which no later impressions could ever entirely obliterate from the minds of onlookers.

A year ago large prizes had been offered for a race against time from Monaco to Cap Martin and back, over the bay. The conditions were easier than for Rougier's flights, as an inclined plane had been built from far back on the quay to the summit of the sea-wall.

ANOTHER SUCCESSFUL FRENCH FLYER: THE BRÉGUET BIPLANE IN FULL FLIGHT.

Over twenty entries were received, but not one ever attempted the feat, or even came to Monaco for the purpose.

In the future it will seem almost unbelievable that a single year could have made such a difference in the development of the art.

Rougier gave altogether seven of these startling exhibitions. All of them were marked by astonishing control and skill and no less astonishing daring, but one or two stand out among the seven for their peculiarly sensational character.

GLIDING IN AUSTRALIA. FLORENCE M. TAYLOR PILOTING A MOTORLESS BIPLANE AT NARRABEEN, NEAR SYDNEY.

On one occasion the Voisin was made to climb to the level of the Mont Agel—over 3,000 feet—and steered through the lofty defile of La Turbie. It was only several minutes after it had disappeared over the village of that name that it once more came into view, to the unmitigated relief of the watching thousands below, who, no longer hearing the motor, feared it might have stopped running and caused a landing in the rocky and precipitous wilderness beyond La Turbie.

When he was once more over Monte Carlo, Rougier turned his elevator down at a sharp angle and literally let himself drop for half a mile, with his motor and the force of gravity cooperating to drive him downward at terrific speed.

Three minutes later he alighted from his machine at the entrance of his shed.

In the uncontrollable enthusiasm which ensued both he and his machine narrowly escaped harm.

Rougier's last flight was no less awe-inspiring.

OLIESLAEGERS, THE DARING BELGIAN, AND A GLIMPSE OF THE FRANCO-MOORISH ALGERIAN TOWN OF ORAN, OVER WHICH HE RECENTLY STEERED HIS BLÉRIOT.

Notwithstanding the stiff western breeze blowing, he had started out with the intention of flying to Nice—ten miles to the west, along the Riviera.

After turning the point of Monaco, the Voisin met the full force of the thirty-mile wind and made but slow headway. It had got within four miles of Nice, however, and was opposite the naval harbor of Villefranche, when the wind developed into a regular gale, blowing for several minutes at a velocity conservatively estimated at forty miles an hour. (Several aeroplane sheds were blown down at this precise time a few miles from there.)

Rougier was high enough up and far enough from land to escape the worst inequalities of the wind, which of course constitute the only danger to equilibrium, but the speed of the Voisin being forty miles an hour, the wind exactly counterbalanced it and he was unable to make any headway, the astonishing spectacle being witnessed by those on the convoying torpedo-boats, of the aeroplane tossing and rocking in the breeze, but remaining absolutely stationary in relation to the coast.

As far as we know this is the first time an aeroplane has flown in a wind of velocity equal to its own.

Seeing the futility of persisting, Rougier turned around and was instantly carried off like a great box kite of which the string has snapped, tearing before the gale at eighty miles an hour and in a few seconds leaving the torpedo-boats far in the rear.

He was, however, able to land safely, his shed being to the east or lee-side of the Rock, at Monaco.

Morocco

The special envoy of Morocco, Ben Asus, while on a recent trip to Europe made an ascension in the German balloon "Hildebrandt." This first instance of official interest being shown by Morocco in aeronautics is no doubt attributable to the fine work of the European military balloons at Casablanca.

New South Wales

Australia has long been interested in aviation (one of her sons, Lawrence Hargrave, being one of the world's greatest pioneers), so it is with no surprise that news is received of her activity in the new field.

The Sydney magazine "Motor" has started an aviation section under the control of Geo. A. Taylor, whose practical work in Australian aeronautics and enthusiasm in that sphere resulted in the formation of the Aerial League of Australia, as well as in winning the interest of the Commonwealth Government in officially recognizing the vital importance of aerial defense by offering the $25,000 prize referred to in a previous issue of Aircraft.

The first flight ever made in Australia is to the credit of Mr. Colin Defries, driving a Wright biplane.

We believe this is the first flight made south of the Equator, for it antedates by some days those made recently in South America.

Persia

One of the most enthusiastic spectators of Efimoff's recent flights at Odessa was the ex-shah of Persia; he imported the first automobile to be seen in Teheran and is apparently keeping just as much up with the times as heretofore.

Peru

Great interest is being shown at Lima in the latest exploits of Georges Chavéz, now piloting a Henry Farman biplane in France. Chavéz, although he has lived in Paris many years, is a Peruvian. He seems destined to be a great aviator, and although only a novice already ranks fourth in the High Flyers of the world, only Paulhan, Latham and Rougier ranking above him in this respect. Chavéz is an old football player and runner of the Racing Club de France.

Portugal

After his Spanish campaign, Edmond Poillot, the journalist-aviator, is to fly at Lisbon.

No aviator has visited Portugal since Zipfel's visit last year, when he made the first flights ever seen there.

Roumania

Even since Blériot flew at Bucharest last October, Roumanian sportsmen have been wishing to see more of the French men-birds; Delétang is the latest aviator to sign a contract to fly at Bucharest.

Russia

Latham is to fly at Petersburg, Warsaw and Moscow in May, and Efimoff, one of Henry Farman's most successful pupils, is making flights at Odessa, his native city.

Guyot is also to return to Russia; his flights last year met with great success.

A sum of $480,000 is to be immediately spent on building an aerial fleet, and more will be asked of the Government.

The latest addition to Russia's aerial navy is two Zodiac dirigibles. There is much rejoicing in France at this order, as it was feared that these small airships would be ordered in Germany.

Spain

The deplorable accident which resulted in the death of Henri Le Blon during the aerial tournament at San Sebastian (where, for some obscure reason, the Blériot was dashed to the rocky coast below, as it was circling the historic palace of Miramar, on April 2) brings to mind in very vivid fashion a public correspondence carried on by Le Blon and by Blériot, through the sporting papers of Paris early last January.

Blériot disclaimed all responsibility in the fatal accident which had just occurred to Leon Delagrange, asserting that the unfortunate aviator had risked his life and lost it through changing the original 25-h. p. Anzani motor for a 50-h. p. Gnôme motor, to make the machine more speedy.

Le Blon, who was associated with Delagrange, replied that the latter had committed no imprudence, and implied that Blériot was agreeable to the change made by Delagrange.

In "L'Auto" of January 9 appeared Blériot's answer to Le Blon's letter. It read as follows and its significance seems terribly apparent now:

Paris, January 8, 1910.

The Editor of L'Auto.

Dear Sir: I read in your estimable paper of this date a letter from Mr. Le Blon, the associate of Mr. Delagrange, which would tend to attribute a share of the responsibility of Mr. Delagrange's accident on my machine.

In consequence, and as I have already had the honor to assert, I declare in the most emphatic manner that it is entirely outside of my advice or consent that Mr. Delagrange placed on his machine a 50-h. p. motor which he bought directly from the makers and to the mounting of which he attended himself.

It is an everyday occurrence for me to deliver to inventors machines of the Channel Crossing type, without their motor.

These people think they will improve the machine by changing its motor plant. You will understand, and Mr. Delagrange was in this class, that under these conditions my responsibility cannot be at stake in any way, as it is wholly obvious that a machine built to receive a motor of a certain power cannot support another of double the power.

I regret that on this point many aviators see fit to changing, themselves (on the plea of improving them), the machines that we deliver to them, and this thing is deeply to be regretted.

I avail myself of this letter to warn Mr. Le Blon against his machine, which is exactly similar to that of Mr. Delagrange. This machine, which Mr. Le Blon is to use at the Heliopolis meet, and which was delivered to him by the Gnôme Society the very day of the death of Mr. Delagrange, is exactly "in the same boat" as that of Mr. Delagrange, that is to say that the motor was bought and mounted on one of our frames outside of my intervention. This framework is a construction intended to receive a motor of 25-h. p. It is true that it can resist a greater strain, as Mr. Delagrange proved himself, by beating with this machine, at Juvisy, all records for monoplanes, with a flight of more than two hours and a half, but it is certain that under these conditions it is working with a relatively smaller guarantee of safety.

ROUGIER AT MONTE CARLO.

A VIVIDLY COLORED BACKGROUND OF SCENIC BEAUTY FOR A MASTERLY AERONAUTICAL PROWESS. THE CASINO ON THE LEFT WITH THE FAMOUS TERRACES PACKED WITH WONDERING TERRESTRIANS.

I ask nothing better than to assume the responsibility of my machines, when the clients use them as I deliver them to them, but the slightest modification can cause the most serious accidents, and especially a change like the replacing of a 25-h. p. motor by one of double the power, like Messrs. Delagrange and Le Blon saw fit to do, and this, however excellent may be the motor, as is the case of the "Gnôme," which has certainly proved its worth.

Believe me, dear sir,

Yours very sincerely,

LOUIS BLÉRIOT.

Henri Le Blon, before taking up flying, was an automobile race driver of international reputation. He has driven Panhard-Levassor cars in most of the big European races, and, with his beard flying in the wind, was a familiar figure on these occasions, driving with great dexterity and using rare judgment on the curves. He finished third in the Ardennes Circuit of 1905 (a race won by de Caters, who was also to take up aviation). He was sixth in the Targa Florio, the big Sicilian race, in 1906. He was also well-known on this side of the Atlantic and drove a Thomas car in the Vanderbilt Cup race of 1906. He took up aviation last September, being among Blériot's first pupils; he then flew in Belgium and later at Doncaster, where he shared the honors with his team-mate, Delagrange, and made the longest flight of the meet.

Recently at the Heliopolis meet he did some very fine work, finishing first in the Speed Prize, second in the single lap prize, third in the longest consecutive flight prize and second in the totalized distance prize (see last month's Aircraft). He was entered for several of the coming meets, notably those at Cannes and at Lyons, but, like Delagrange, was not destined to reap the fruits of his cleverness and of his daring. His name is now to be added to the

LIST OF THE MARTYRS OF AVIATION.

Selfridge, 1908, Wright biplane, passenger.
Lefebvre, 1909, Wright biplane, pilot.
Ferber, 1909, Voisin biplane, pilot.
Fernandéz, 1909, Fernandéz biplane, pilot.
Delagrange, 1910, Blériot monoplane, pilot.
Le Blon, 1910, Blériot monoplane, pilot.

Switzerland

Captain Engelhard continued his flights at San Moritz last month, and on one occasion flew thirty-two minutes around the lake. Notwithstanding the altitude, the German Wright had little difficulty in rising from the ice.

The interest of the habitués of San Moritz, already whetted by Mr. Auff'm Ordt's abortive attempts at flight over the lake last season, was raised to fever point by Engelhard's great flights. It is interesting to note that Captain Engelhard has affixed a small box-kite tail to his machine. It is placed high up on the machine, just to the inside of the rear vertical rudder.

The Geneva aviators, Speckner, Carfagni, Nigg, and Dufaux, have established their headquarters just across the French frontier, at Viry.

Tonquin

French Indo-China is determined not to fall behind the parent country in the development of aviation. Both Haiphong and Hanoi already have several adherents to the French National Aerial League. Several machines are being built, one of which is about to be experimented with.

An aviation club has also been formed, and there is talk of an aviation meet!

Tunis

Aviation is interesting the authorities, and it has already been decided to hold an important meet in conjunction with the International Exposition to be held here next year.

Venezuela

The Minister of Public Works is desirous of acquiring aeroplanes for the Venezuelan Government, and has commissioned a representative to investigate the various French types and ascertain the conditions of purchase.

BIG MEN OF THE MOVEMENT

A. B. LAMBERT

A. B. LAMBERT, to whom his native city of St. Louis owes much of its prestige and popularity as an aeronautic center, is now thirty-five years of age. He graduated from the University of Virginia in 1896.

It was during the three years spent in France that he became interested in ballooning. Joining the Aero Club of France, he made numerous ascensions around Paris, easily fulfilling the conditions required to obtain the license of pilot.

Mr. Lambert is also Pilot of the Aero Club of America. He was for two years the President of the Automobile Club of St. Louis, which was, in fact, organized by him.

He is now the President of the Aero Club of St. Louis, which gained international fame for its management of the Gordon Bennett Cup Race of 1907.

This year the race has once more been allotted to St. Louis, in which case a perfect organization of the big event may again be counted on.

Mr. Lambert considers the balloon grounds of the Aero Club of St. Louis the best in the world, the gas plant is such that 440,000 cubic feet of gas can be furnished per hour.

Under the presidency and leadership of Mr. Lambert the Club is rapidly increasing its membership, which at present numbers six hundred.

The Aero Club of St. Louis owns three balloons for the use of its members, of which five are licensed balloon pilots.

Mr. Lambert is a thorough all-round sportsman and won the Missouri State Golf Championship in 1908.

He also occupies a high position in the business world of St. Louis, serving one year as President of the St. Louis Paint, Oil and Drug Club, and being at present President of the Lambert Pharmacal Company, which has offices or agencies in the principal countries of the world.

In 1903 Mr. Lambert was a Vice-President on the International Jury of the St. Louis World's Fair.

He was elected to the City Council of St. Louis in 1908, and is a Director of the Mechanics' American Bank.

Of all men in the near and far West interested in the development of aeronautics and they number many thousands—probably none is more deserving of figuring among the "Big Men of the Movement" than Mr. Albert Bond Lambert, of St. Louis.

Prominence and wealth have not always at their disposal, to further an idea, such valuable assets as the enthusiasm of youth and a remarkable natural executive and organizing ability, fostered by early experience in positions of trust and responsibility.

Mr. Lambert's latest big idea is to unite the Western aero clubs into a federation. Such a conception is not one to enter into lightly and without weighty consideration; but the connection of the Aero Club of St. Louis's president with the idea shows that, if decided upon, it will be well carried out and will accrue to the benefit of all concerned.

ISRAEL LUDLOW

ISRAEL LUDLOW, a prominent attorney of New York, is one of the charter members of the Aero Club of America.

He early took an active interest in aeronautical experimental work, and during the year 1905 constructed a number of full-sized aeroplanes in order to study the equilibrium and lifting power of supporting surfaces in full-sized machines. These aeroplanes he had towed as a kite by an automobile or a fast motor boat. Charles K. Hamilton, the well-known aviator, was in the aeroplane in most of these flights, some of which reached a height of six to seven hundred feet.

In the spring of 1906 Mr. Ludlow went to Florida to make some experiments there, Mr. Hamilton going also to fly in the aeroplane, in connection with the automobile races on the Florida beach, on the Atlantic Coast. During one of these experiments of towed flight Mr. Ludlow was in the aeroplane, which was of an exceptionally large size, when a heavy gust of wind coming from the ocean caused it to collapse and its supporting surfaces to turn vertically upward. A fall of about one hundred feet resulted, and in the wreck Mr. Ludlow sustained an injury to the lower part of his spine, affecting the nerves of the legs.

After a serious and protracted illness, steady improvement has taken place in his health and strength.

Mr. Ludlow still continues his legal work and interest in aeronautics. He is one of the attorneys for the defendant in the suit of the Wright Brothers against Louis Paulhan, the European aviator, and represents the legal interests of other well-known aviators.

In 1907 he was at the head of the Department of Aeronautics of the Jamestown Exposition.

There are few men as well known in aeronautic circles in and out of New York as Israel Ludlow. Notwithstanding the very serious nature of his protracted infirmity, his genial, cheerful disposition ever prevails, and in the very large number of people he knows, he has no acquaintances—only friends.

Very popular at the Aero Club of America, he has been a member of the House Committee of the Club, and is at present on the Library Committee, with his friends, Mr. Campbell Wood and Professor Rotch.

Mr. Ludlow was Chairman of the Publication Committee which issued the Aero Club book, "Navigating the Air." He has contributed many articles to newspapers and periodicals, setting forth both the technical and popular sides of aerial navigation.

Mr. Ludlow has been attorney of record in a number of noted cases where large public interests have been involved. He represented the Horseman's Association in the preparation of the "Rules of the Road" Ordinances in the City of New York, the colored people in Race Riot cases of 1905, an association of property owners in testing certain municipal street railway franchises in the Borough of the Bronx, and has appeared as counsel in other equally well-known legal actions.

CHARLES JEROME EDWARDS

CHARLES JEROME EDWARDS' interest in aeronautics dates from a casual meeting in Egypt some years ago with Patrick Y. Alexander, the father of aeronautics in Great Britain, and a man who has probably done as much, by his devotion of both time and money, to the science and sport as any other man now living. When the Aero Club of America was organized in 1905, Mr. Edwards was one of the charter members, joining with Captain Hedge, Cortland Field Bishop and others in the organization and extension of work.

When Count De La Vaulx came to America in the spring of 1906, to arrange for several balloon flights, and added his experience and prestige to the general interest, Mr. Edwards was one of the first to make an ascension with him in the famous "Centaur." His interest in aeronautical subjects has never flagged since then.

In 1906 he was selected a director and treasurer of the Aero Club of America, and has continued to hold those positions ever since.

In business relations Mr. Edwards is identified with many commercial and civic bodies, being manager of the Equitable Life Assurance Society, and a director in various financial and insurance companies. He was for a number of years actively identified with automobiling as a sport, having been Director, Treasurer and President of the Long Island Automobile Club, and also an officer of the New York State Automobile Association.

He is a believer in the purely sporting interests of both automobiling and aeronautics as distinct from the commercial and exhibition features thereof, and has stoutly held that the two should be separate and distinct, and that aviation and other aeronautic sports should not in any way be made supplemental to or dependent upon any question of exploiting a commercial product or of gate money receipts.

Mr. Edwards is thus just the type of man needed in this country to develop aeronautics along the proper lines, and retain dignity to the sport and science of aerial navigation. With some others, he is devoting both time and money to this end; he makes no restrictions as to the particular branch of the art to be encouraged; he holds that the spherical, the dirigible and the flying machine have all their part in the Conquest of the Air, and there is no balloon or aviation meeting too distant for Charles Jerome Edwards to visit for the purpose of lending his assistance towards making the affair a success and a credit to the kindred sciences of aerostatics and aerodynamics.

As right hand man to Cortland Field Bishop, Mr. Edwards has also done sterling work in the Aero Club of America; he has worked hard and conscientiously in the club's interests and in the coming task of organizing the big Gordon Bennett Cup meets this Fall, it is a foregone conclusion that no one will do more towards making them the signal successes they deserve to be than he. If they are not the greatest aeronautical contests the world has ever seen, it is safe to say that the fault will not be at the door of Mr. C. J. Edwards.

BIG MEN OF THE MOVEMENT

NADAR

FELIX TOURNACHON, better known by his nom de plume, Nadar, was born in Paris, on April 5, 1820; he died on March 21 last, ninety years of age all but two weeks.

The name of Nadar does not suggest as much to the present generation as it did to the last. Nadar was, in fact, in his country, one of the celebrities of the Second Empire.

He was engaged in photography when that science was in its infancy, he was an aeronaut at a time when it was practised by but a few daring men, and lastly he was a champion of the "heavier-than-air" principle when the problem appeared to present about the same chances of success which that of reaching the moon or that of sending parcels by wireless do to-day.

A man of great imagination and a talented writer, Nadar entered the higher class of journalism and wrote for many of the best newspapers of France. Later he achieved celebrity as a caricaturist.

In the revolution of '48 Nadar was on the Bonapartist side; he went to Prussia, was made a prisoner of state there and finally returned to Paris and took up the new science of photography.

He conceived many improvements in this line, and his name is known the world over to photographers as one of the men who did most to make the science what it is to-day, just as another famous French protagonist of heavier-than-air craft—Clement Ader, is known to those connected with the telephone for his inventions in this line.

Henson and Stringfellow in England were experimenting at this time with flying machines, but it was only in 1860 that Nadar's attention was first drawn to aviation. He then made the acquaintance of the theorist de la Landelle and soon became an ardent supporter of the principle of the heavier than air.

It is said that one of the things which contributed most to deciding him in this line was the sight of a man increasing the weight of a sponge by wetting it, so that he could throw it up to a workman who had dropped it from a scaffolding.

Nadar issued a manifesto at about this time in which he explained that the conquest of the air could never be made by lighter-than-air craft. "To fight the air, it is necessary to be specifically heavier than air" was what he was ever wont to repeat. "It is the propeller which is going to enable man to fly."

Although he was an aged man before the first flying machine left the ground, it would seem as if he refused to leave this life before seeing his dream fully realized.

When Farman won the Deutsch-Archdeacon prize two years ago, and when Blériot crossed the Channel last year, they hastened to telegraph the news to Nadar, as if they feared it might come too late. It is said that the venerable old man wept on learning of these striking vindications of the theories he had tenaciously clung to for fifty unsuccessful years.

WILLIAM RANDOLPH HEARST

WILLIAM RANDOLPH HEARST was born in San Francisco on April 29, 1863. His father was United States Senator George Hearst.

He was educated in the San Francisco public schools and at Harvard University. At twenty-three he began his newspaper career as the editor and proprietor of the San Francisco Examiner. It was only nine years later that Mr. Hearst bought the New York Journal. He subsequently bought the Advertiser to secure a news franchise, and then founded the New York American.

His newspaper activities have by no means been confined to San Francisco and New York, however, for the following representative publications owe their existence to him: the Chicago American, founded in 1900; the Chicago Morning Examiner, in 1902; the Boston American, in 1904; the Los Angeles Examiner, in 1904.

Mr. Hearst began his political career in 1901 as a Democratic candidate for Congress from the Eleventh District of New York; he was elected to this—the Fifty-eighth—Congress and also to the Fifty-ninth. He later was elected President of the National League of Democratic Clubs, and in 1905 was candidate for mayor of New York on the municipal ownership ticket. The following year found him candidate for Governor of New York on the Independence ticket, and last year he ran for mayor of New York on the Civic Alliance ticket.

Mr. Hearst is a member of many clubs; among them the Manhattan, Union, New York Yacht, Columbia Yacht, Brooklyn Yacht, New York Press, of New York, and the Pacific Union, of San Francisco. He resides at 137 Riverside Drive, New York.

On April 28, 1903, he married Miss Millicent Willson, daughter of George A. Willson. Their three children are boys.

Mr. Hearst, who is ever ready to encourage every line of human progress, and who is in particular an enthusiast of the newer forms of locomotion, has a well deserved place among AIRCRAFT's "Big Men of the Movement." A new recruit among those interested in aviation, he is one of the few big public men who have as yet soared in a flying machine. Mr. Hearst had this experience last January, at Los Angeles, when Louis Paulhan, the famous French aviator, took him for an air trip on his Farman biplane.

Friends of Mr. Hearst in the East received most enthusiastic telegraphic descriptions of this "baptism of the air."

The air trip lasted about a quarter of an hour; through the unexpectedness of the event, Mr. Hearst was in no way prepared sartorially for his dash through the atmosphere at forty-five miles an hour, and was consequently thoroughly chilled on alighting; he would, however, have gladly continued his flight for much longer, so exhilarating did the experience strike him, and so unexpectedly secure did he feel on the flyer.

Since that day aeronautics, and in particular aviation, can count on William Randolph Hearst as one of its most prominent patrons.

LIEUT.-COL. HERMANN MOEDEBECK

WITH Lieutenant-Colonel Hermann Moedebeck, whose unexpected and somewhat premature demise (he was in his fifty-third year) occurred on March 1, disappears a man who had perhaps exercised more influence on the development of aeronautics in Germany than any other.

When he threw himself into the arena nearly thirty years ago, his country was wholly indifferent to the new problem; the military use of balloons, in particular, appeared quite chimerical. He began, however, by word and pen the work of slow initiation, which was ultimately to awake public opinion. The first embryonic organization of aerostatic troops in the German Army is certainly due in great part to his persevering insistence, although, belonging to the artillery, he did not himself have occasion to serve in this special branch of the service.

Colonel Moedebeck did not devote himself, literally speaking, to the practise of aerial locomotion: he was a technician and especially a highly informed and documented writer.

His first important work, a general treatise on aeronautics, dates back over twenty-five years. At the same time he founded the Zeitschrift fur Luftschiffahrt (which later became the Illustrierte aeronautische Mitteilungen), which he succeeded in making a powerful agent of propaganda of aeronautic knowledge. His articles, his pamphlets, his lectures, and especially his excellent Taschenbuch zum praktischen Gebrauch fur Flugtechniker und Luftschiffer, of which the first edition is dated 1904, placed Lieutenant-Colonel Moedebeck among the greatest authorities on aeronautics.

This latter work was translated in Russian and English, and ranks with Chanute's "Flying Machines" as an aeronautic classic. Some years previously Moedebeck had received the gold medal presented by the Sportsman's Show at Munich to the best work on aeronautics.

Another popular work of his is "Die Luftshiffahrt, ihre Vergangenheit und ihre Zukunft," which came out four years ago. This little book might well be considered the *vade mecum* of all those desirous of knowing just what led up to the present successes in aerial navigation; the history of dirigibles in particular is a very complete and interesting expose of the efforts of the pioneers in this field.

Colonel Moedebeck died in his native city of Berlin, and the news created consternation in aeronautic circles not only in his country but the world over.

Moedebeck came of a very old family which derived its name from the town of Medebeck. He started in his military career at the age of twenty in the Sixth Foot Artillery Regiment of Silesia, and it was about five years later that aeronautics first began to interest him.

He was Vice-President of the permanent international Committee of Aeronautics and President of the German Committee of Aeronautical Maps, to the work on which he had devoted, for the last year, the greater part of his activity.

NEW FLYERS DESCRIBED

IT is the intention of the editors of AIRCRAFT to present every month original scale drawings of the more remarkable or successful machines. At the request of numerous subscribers the Pfitzner monoplane and Herring-Burgess biplane are presented this month. These drawings are possibly not the first published of these machines; they claim originality, however, in absolute accuracy of detail, a point on which the greatest vigilance will ever be maintained in these columns.

A single glance at the annexed side elevation and plan will convince the initiated of the remarkable originality displayed in the construction of the single plane machine recently constructed by Mr. A. L. Pfitzner, in the Curtiss factory at Hammondsport, N. Y.

This machine has made several flights over Lake Keuka and is possessed of great speed.

Each of the wings of the main plane is made in three sections, each five feet long, which are attached and connected by steel sockets and steel cable, the latter forming a symmetrical double king truss with the beams, the king posts being at the junction of the detachable sections. The wings are set at an angle of five degrees.

The curvature of the surface is of the high-speed type, with the center of pressure eighteen inches from the front edge. The ribs have a camber of three and three-quarters inches in a six-foot length, the highest part of the surface being one and one-half inches above the front edge, while the angle of incidence is eight degrees.

The unique feature of the monoplane is the system of equalizers at the tips of the main planes. The main surface, as seen in the plan, stops short thirty inches from the end of each wing, and in this space slides a panel thirty inches wide by fifty deep, of the same curvature as the main surface.

These two balancing tips are inter-connected to the hand wheel, and normally they project fifteen inches at each end.

The three controls—vertical, horizontal and lateral—are embodied in a single wheel, which is pushed forwards or backwards to raise or lower the elevating plane, twisted to right or left to steer in a horizontal plane, and turned to ensure lateral stability through the sliding panels referred to above.

The Pfitzner monoplane is fitted with a Curtiss 25-h. p. four-cylinder motor, driving a six-foot spruce propeller of four feet six inches pitch at 1,200 revolutions per minute, ensuring a thrust of 235 pounds.

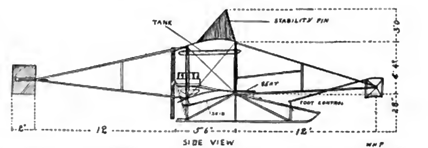
The Herring-Burgess biplane is a result of the cooperation of A. M. Herring, the inventor and builder of many flying machines, and of W. Starling Burgess, the yacht builder of Marblehead, Mass.

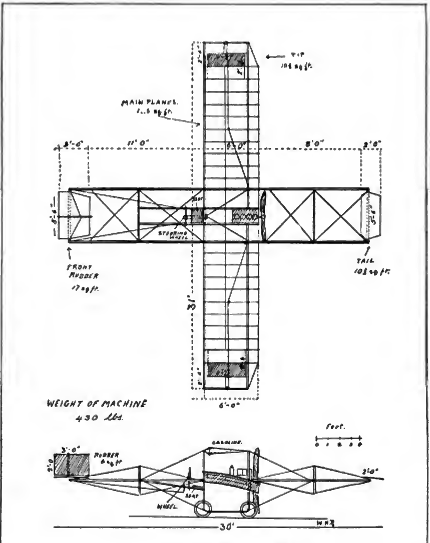
It made a short flight some weeks ago, with Herring at the wheel. Its most salient novelties are the extreme curvature of the planes and the six fins placed above the upper plane, with the idea of ensuring automatic lateral stability; the machine has not been sufficiently tried out as yet to ascertain the full efficiency of this control.

Another novel feature is the use of foot control, to operate the elevating planes.

The landing apparatus is also both original and ingenious in design, the aeroplane resting on a single skid or runner with, on each side, two smaller slightly elevated skids, on one of which the machine leans when at rest.

HERRING-BURGESS AEROPLANE





PFITZNER MONOPLANE.

RECORDS & STATISTICS

SO much favorable comment has been made on the records and statistics published last month in this magazine that those interested in exact and precise data will be glad to know that AIRCRAFT intends from month to month to keep as much up-to-date in this line as in every other.

In April, reference was only made to performances antedating the current year.

By January 1 last just nineteen men had succeeded in making flights of one hour. It is a little startling to contemplate that this sum-total of human effort in that direction (up to that time) has been increased 75 per cent. in the first twelve weeks of 1910. In other words the list now numbers thirty-four.

The order in which these master
complished the feat is given
the first nineteen can be fou
data, those of the added thirte
(1) Orville Wright, Septemb
bur Wright, September 21, 190
May 20, 1909; (4) H. Lathar
Paulhan, July 15; (6) H. Farn
Sommer, July 22; (8) C. de I
(9) F. S. Cody, September 8
September 20; (11) Louis Blér
P. de Caters, October 10; (
hard, October 20; (14) Lieut
November 3; (15) E. Chateau,
J. de Lesseps, December 16;
ger, December 21; (18) J. Bal
(19) L. Delagrange, December

FLYING MACHINE MODELS

By W. H. Phipps

REALIZING the interest being taken in the sport of model flying and in answer to many requests, this magazine has thought it advisable to help end encourage those interested in this fascinating branch of aeronautics. Every month AIRCRAFT will devote a page to model making and flying, together with news of the model clubs throughout the country. Drawings of the more successful types will be published, together with detailed descriptions and explanations of their construction.

The Young Men's Christian Associations throughout the country have now taken up the subject and study of aeronautics. To encourage interest the various branches are arranging numerous model contests, and they are in all cases well attended and productive of highly interesting work.

TROPHY PRESENTED BY LEO STEVENS FOR LONG DISTANCE MODEL CONTEST.

The West Side Branch has been holding regular bi-monthly contests in the Twenty-second Regiment Armory, New York. That held on March 12 was one of the most successful; twenty odd machines were entered, the winners in the boys' class being: F. M. Watkins, first, with a monoplane of his own make and design which flew 121 feet 7 inches; Percy Pierce, second, with a Langley type which covered 113 feet 3 inches; Ralph Barnaby, third, with 76 feet 2 inches.

The model of F. M. Watkins is deserving of special interest, inasmuch as it has been regularly winning in these contests for some time past. This model is of the front rudder type and driven by two large propellers situated in the rear of the main plane; the latter is flat.

The Aeronautic Society recently held, at the Sixty-ninth Regiment Armory, New York, an elimination contest for the purpose of selecting a team of three to represent it in the Octave Chanute Challenge model cup contest. Both men and boys were invited to enter, and it turned out that the first three winners were boys.

Watkins again secured first place with his crack flyer, which this time flew 148 feet. Lawrence J. Lesh, the champion glider, was second with a flight of 125 feet; his model is entirely constructed of wood, the parts being held together with rubber bands. It is interesting to note that Lesh is constructing a full-sized front-rudder monoplane on the lines of this model. Ralph S. Barnaby was third, with a flight of 114 feet; it is built on the lines of the famous Santos-Dumont "Demoiselle," and was quite the most graceful glider there.

Other contestants were W. Morrill Sage, Dr. Dederer, Louis B. Adams, W. S. Howell, Jr.

The International School of Aeronautics will hold on Sunday, May 15, a kite and model contest at its aerodrome, at Garden City, L. I.

Professor Lawrence Rotch and Mr. Campbell Wood, who recently visited the School, have kindly consented to act as judges.

The kite competitions will be for stability, lifting capacity and altitude.

Experiments will probably be made with man-carrying kites, similar to the trials recently made by Captain Sacconey in France.

The model contests will be for gliding models and motor-driven models, which must be able to fly in a moderate wind. These outdoor contests should afford a fine test of their stability.

If weather conditions do not permit of flying the models, other competitions will be organized at a later date.

The rules of the International Aeronautic Federation will govern the different contests.

The National Model Aero Club has been organized in New York. The object of the Club is to regulate model contests in this country. The directors of this club have laid down a set of rules to govern these contests and to be used by all clubs competing for prizes offered by the National Model Aero Club. The organizers of the club are: W. H. Crocker, President; W. M. Sage, First Vice-President; P. W. Wilcox, Second Vice-President; F. S. Crocker, Secretary; Mr. T. Talmage, Treasurer. The other directors are: A. L. Stevens, the celebrated balloonist; Edward Durant, the energetic director of the Junior Aero Club; A. Armstrong, and L. W. Houck.

We append the rules referred to:

I.—These rules shall apply to indoor and outdoor contests, and shall be enforced at all open competitions held by the clubs or societies affiliated with the National Model Aero Club.

II.—No flights made by models shall be deemed official or count as points towards the winning of any cup, medal or trophy offered by this club, or those offered by any affiliated club or society unless under these rules.

III.—Entrance in any competition held under the auspices of the N. M. A. C. shall be held as an unconditional acceptance of these rules as interpreted by the judges.

IV.—Each contestant shall register his or her name, address, age, and type of machine with the proper person before the event for which they are entered, and will then be assigned a number.

V.—Every machine competing must be built or designed by the competitor (No toys allowed). Every machine must be built on practical lines; that is, in a form capable of development to a man-carrying machine.

VI.—A machine must conform to the following:

(a) Must be equipped with suitable wheels or skids.

(b) Motive power must be self-contained.

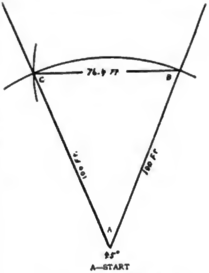
(c) Must be capable of starting under its own power.

VII.—All machines must be started from a table or platform which shall not be over three (3) feet in height from the floor or ground; distance of flight shall be measured from the edge of the platform in the right direction of flight.

VIII.—Each contestant shall be allowed three trials in every class for which they are entered.

No flight shall be counted as such unless the machine covers more than twenty (20) feet. But only one such "no start" shall be allowed.

If any machine collides with a spectator, or suffers any interference within the lines of flight, that flight shall not be counted against the competitor.



OFFICIAL LANDING AREA ACCORDING TO N. M. A. C. RULES.

Any machine which turns over in the air or alights improperly shall be disqualified for that flight.

In the outdoor competitions all machines must be started facing directly into the wind.

IX.—Special prizes may be given for stability, excellency of construction, originality of design and special contests.

X.—These rules may be amended every year at the annual meeting of the N. M. A. C.

XII.—The above is the course laid out: any machine alighting properly within these lines will be qualified as a flight.

The public school boys in New York are taking up model flying in earnest. It has come to be a regular part of the inter-school competitions. So far the boys have been content with flying models, but they expect to build full-sized machines after the designs of their most successful models.

Seven schools have formed aero clubs. They are: No. 69, No. 77, No. 78, No. 1311, No. 1611, No. 166, and No. 173. Several meets have been arranged and various models will be tried.

CLUB NEWS

Compiled by Ada Gibson

~~balloon flight in New England during~~ Hoyt, J. C. McCoy, Com. E. C. Benedict and F. N. Doubleday. On Mr. Rudolph Schroeder's
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Fairchild, who has just com-
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ho has purchased the machine
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ent.

MAY.

On page 110, Sommer is quoted as the seventh man to fly for an hour in view of his flight of July 22nd, 1909; he should, however, be placed sixth in view of his flight of July 18th. This mistake is referred to on page 144, but is worth pointing out here.

In this list of the first men to make hour flights should figure Hamilton's name; this omission is repaired on page 189.

J. C. IRVINE, PRESIDENT OF THE PACIFIC AERO CLUB, SAN FRANCISCO.

Pacific Aero Club

THE Pacific Aero Club was organized May 11, 1909, with twenty-five charter members, all enthusiastic and actuated by a desire to build up a substantial organization, to foster the interests of scientific and practical aeronautics, to lend aid, assistance and encouragement to its members and worthy inventors who are making an honest endeavor for the advancement of the science of aviation. They also have in view the beneficial effect from a social and sporting standpoint, California being favored with the best climatic conditions of any locality in the world.

They propose to have their own motordrome, where they can give annual midwinter aviation meets, monthly balloon races, etc. Three months after their organization they gave a most successful indoor entertainment, filling one of the largest halls in San Francisco. A few months later they promoted the most successful series of balloon races that have taken place on the Pacific Coast. They are now making elaborate preparations for their first anniversary, and expect to entertain twenty thousand people in their three days' session. Some very promising and novel ideas of aerial craft have been evolved by members, and some full-sized machines are in process of construction.

They have a good membership composed of some of the best and most representative citizens of San Francisco.

The officers of the club are: J. C. Irvine, President; H. A. Chandler, Secretary, and Joseph Maston, Treasurer.

PROFESSOR DAVID TODD, PRESIDENT OF THE AMHERST AERO CLUB.

Aeronautic Society of New York

By C. F. Blackmore, Treasurer

THE past month has witnessed a period of unusual activity in the affairs of The Aeronautic Society. The new officers and Board of Directors have taken hold with an enthusiasm that augurs well for another successful year. With the experienced hand of Mr. Hudson Maxim at the helm, the Society looks forward to a season of continued advancement and prosperity.

Arrangements have been made for the erection of an aerodrome on the Society's grounds at Mineola. Work has already been begun, and it is expected that the building will be completed and ready for occupancy about May 1. The plans call for an aerodrome 48x150, which it is hoped will suffice for this season, although from present indications it will not be long before another building will be required.

Dr. Wm. Green has completed another machine and has made several flights. By the end of the month the Doctor will undoubtedly have some new records to his credit.

Messrs. W. J. Deifenbach and Louis Rosenbaum are hard at work on their machines, and will be heard from early in May.

As soon as the Society's aerodrome is completed, several members will at once move to Mineola and commence work, turning their ideas into practical form. It is the intention of the Society to furnish the aerodrome with a complete working equipment, so that members constructing machines will not only have all necessaries, but also some "luxuries" at their disposal.

Undoubtedly, from now on, work done will be rewarded with success. The experimental stage has been passed, and the laws governing successful construction are now so well understood that in future failures will be "few and far between."

The meetings during March were of special interest to the members, and the increased attendance at each meeting is a source of gratification and encouragement to the officers and directors of the Society.

Amherst Aero Club

By Prof. David Todd, President

THE Amherst Aero Club was formed in the autumn of 1908 by the professors and students of Amherst College and townspeople interested in the progress and development of aeronautics.

About twenty meetings hava been held for the discussion of open questions, with many illustrated and other lectures for general audiences of town and gown.

Several famous aeronauts, including Mr. C. J. Glidden, of Boston, Mr. Augustus Post, of New York, and Mr. Leo Stevens, of New York, have given the Club interesting addresses on their ballooning experiences.

On one occasion Mr. Hiram Percy Maxim, President of the Hartford Aero Club, gave an account of his first aerial trip and a demonstration in the old College Hall of his remarkable invention, the gun silencer.

His uncle, Mr. Hudson Maxim, who was recently elected President of the Aeronautic Society of New York, also gave a lecture on the future of aerial navigation in warfare and a demonstration of his wonderful inventions in the realm of explosives.

At another meeting Mr. N. H. Arnold related his hairbreadth escape in ballooning over the North Sea.

Further lectures in the early future will be given by Professor Moore, Chief of the Government Weather Bureau, and Mr. Glenn H. Curtiss who has promised to speak on foreign and American contests in which he has competed.

Several members of the Club made balloon ascensions last season. Professor and Mrs. Todd, with Mr. Glidden as pilot, made an ascension from Fitchburg in August, 1909, and Mr. Mitchell, Mr. Strauss and Mr. Tucker, of the senior class, made an ascension from Springfield last November with Mr. Arnold acting as pilot.

Plans have already been made for a series of ascensions during the coming season, the first of which will probably take place from Springfield in April.

Mr. Cornell and Mr. Eaglefield, student members, are building a full-fledged aeroplane of the biplane type in one of the College laboratories, the engine for which is all ready to be installed.

A committee of students purchased a glider last fall with which they made several successful flights, Mr. Mitchell and Mr. Van Auken being especially successful in their initial glides, and with the opening of Spring further experiments will be made in South Amherst, where natural facilities exist in the shape of fine hills particularly suitable for gliding experiments.

As a result of a series of experiments carried out by Professor Todd and Mr. S. A. Thompson with heavier-than-air models, a very efficient type of propeller has been determined. What is most needed now is an absolutely reliable motor for full-sized machines.

The Club has started publishing a series of papers, the first being by Mr. Goodnow on the best methods of generating hydrogen for balloons.

The Amherst Aero Club has taken steps toward incorporation and has recently become affiliated with the parent association, the Aero Club of America.

The officers of the Club are: President, Professor David Todd; Vice-President and Treasurer, A. Mitchell; Secretary, W. W. Goodnow; Mechanical Engineer, E. A. Thompson; Auditor, W. H. Kidder.

CLUB NOTES

Members of the Aeronautic Alumni Association of the West Side Young Men's Christian Association, New York, are building a two-passenger biplane.

In all its characteristics, even down to the pitch of the propeller, the aeroplane embodies a composition of the ideas of a dozen men.

After many consultations and discussions on the minutest details, it was decided to build a machine of the biplane type, but which differs widely from anything yet produced in aeroplanes. Every member actively interested in the building of the machine has made some part of it. Considerable time and much thought has been spent on the working out of a special steering apparatus which will not encroach on the Wrights' patent rights and still be practicable and safe.

THE LEWIS ELY CUP.

Dr. Rex C. Northwood of New York is President of the Aeronautic Alumni Association and Francis E. Wilson is Secretary and Treasurer, both of whom, with four other members, are taking an active part in the building of the biplane.

A very handsome cup has been put up by Mr. Lewis Ely, who is one of the directors of the Aero Club of St. Louis, competition for which is open to pilots of that Club. The rules of the contest are practically the same as those governing the Lahm Cup. Several other members of the Club are contributing toward an aeroplane, which is to be used for the training of the club members who wish to learn to fly.

Students of Yale have organized a club to be known as the Yale Aero Club. Although only a few weeks old it has a membership of more than fifty and the building of machines has already begun. Most of its members are students in the Sheffield Scientific School. They are building their own machines, and if any college aero races are held it is probable that an aeronautic building and professional aviator will be selected to train the competitors. Max Hoegen, a member of the new Club, built an aeroplane last year with which he made some experimental flights. The officers of the Club are: R. J. Carpenter, of Winchester, Mass., President; Max Von Hoegen, Vice-President; Reuben Jeffrey, of Norwich, N. Y., Secretary.

RECENT PATENTED INVENTIONS

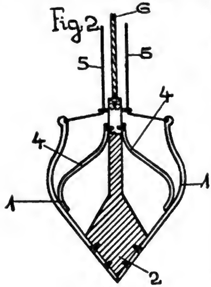
Briefed by Gustave R. Thompson

UNDER the above heading AIRCRAFT will present each month the more interesting of the latest patents granted in Washington.

Space forbids anything but the most summarized review, but those interested in the latest developments in aeronautic ideas will find here an index and up-to-date guide in patent matters.

U. S. Patent 951,942. March 15, 1910. F. von Ehrenberg.

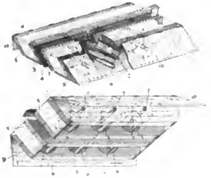
This is an anchor for airships, and, presumably, primarily intended for dirigibles. It consists of a weight pointed at one end which, when driven by a mallet or dropped from above, penetrates into the earth. Spring arms attached to the weight expand and hold the weight fast in the ground. The anchor is released from the ground by drawing on cords attached to the free ends of the spring arms which draw them together, and by drawing upon the main rope attached to the weight.



U. S. PATENT 951,942.

U. S. Patent 952,167. March 15, 1910. A. Wunderlich.

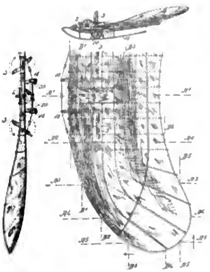
In this device the buoyancy is obtained by a difference in the pressures of air operating upon the upper and lower sides of the apparatus. These different pressures are created by a fan or suction device. The air is rarefied above the device and compressed below. The body consists of a series of cells, open alternately at the upper and under sides, into one series of which the air is sucked and from the other series of which the air is expelled under pressure. Forward motion is obtained by deflections in connection with the fans or suction devices, which direct the air more or less rearwardly from the cell. Wings may be added to the body to assist in sustaining the apparatus, the compressed air being distributed under them, with a corresponding rarefaction above them. No description of steering means seems to be given in the patent.



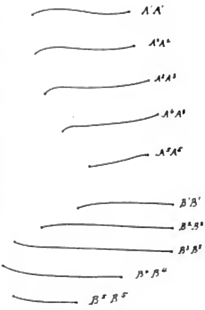
U. S. PATENT 952, 167.

U. S. Patent 952,316. March 15, 1910. T. Etrich and F. Wels.

In this device these well-known Austrian inventors propose to dispense with rudders in steering, and to secure stability entirely by the contour or shape given to the wings. The contour varies both from tip to tip and from front to rear. Near the middle, from front to rear, the wing has a double curve, with a concavity on the under side toward the front. As the wing approaches the tips it more and more loses its double curve and assumes a rearward flare. From tip to tip, at the front, the wing is concave, gradually merging into a convexity toward the rear. The effect of puffs of air from the sides and rear on one wing are counteracted by the other wing. The steering is done by varying the speed of one propeller with reference to the other.



U. S. PATENT 952,316.



U. S. PATENT 952,316.

NEWS IN GENERAL

By Mrs. J. Herbert Sinclair

It is to be regretted that the series of proposed flights by Louis Paulhan at the Jamaica Park race track was abruptly brought to a close after the third day's performance through disagreements arising between the aviator and his manager as a result of the Wright brothers' injunction.

Paulhan's short flights of March 11th and 13th will, however, long be remembered by the New Yorkers who witnessed them.

Cromwell Dixon, of Columbus, Ohio, the youthful professional aeronaut, is about to resume his public flights in an airship of his own design and construction. His past achievements should ensure him numerous engagements, especially during the coming season.

That Hempstead Plains, Mineola, is to become the aviation grounds of New York seems certain. The Aero Club of America is building individual hangars for its members on the ground it leased from the Garden City Realty Company, and so anxious are the inventors and builders of aeroplanes to commence work that several have hired tents to use temporarily until the Club can provide sufficient housing for them.

The Aeronautic Society of New York is building a large enclosed shed 48 feet by 150 feet., spaces in which will be rented to members of the Society according to their requirements.

Just around the corner from these grounds is a small space where is to be found the tent in which Dr. Green stored the biplane which he built for Roy Crosby, of San Francisco, and in which both aviators made such remarkably successful flights prior to the turning over of the machine to the purchaser.

So satisfied was Mr. Crosby with the performance of his new machine that in a few hours after its initial flight it was being dismantled preparatory to shipping it to San Francisco, its final destination. Altogether a dozen short flights were made, and on some of these turns were made with entire success.

The International School of Aeronautics is also close by, and the whole atmosphere of Mineola and the surrounding district is suggestive of things aeronautic.

Prof. T. S. C. Lowe claims to have solved the problem of confining the gas of airships, and thereby sustaining prolonged flights, in the discovery, after many years of research, of a fabric which becomes absolutely gas-proof when treated with a compound of his own invention.

It is claimed that one test of three weeks' duration showed a loss of less than one cubic foot of the contents of the gas bag. Professor Lowe concluded his experiments a short time ago, immediately after which he started on an experimental dirigible. Should his dreams materialize, there will be, in the near future, a passenger-carrying craft plying between New York and the Pacific Coast. The contemplated airship is to be of elaborate design and will contain staterooms and up-to-date comforts. One unique feature of the new craft is that it will require no ballast to govern its movements. It will carry sufficient gasolene and water for a twenty-one days' journey, and its crew will be composed of a captain, a mate, an engineer and four men. Among those who are supposed to be financially interested in the scheme are Clifford B. Harmon, W. J. Hogan, Judge G. H. Gibbs, and E. C. Benedict.

After several years of scientific study and experiments with different types of machines held "far from the madding crowd" in the heart of the Alleghenies, Mr. George O. Lawrence is about ready to publicly launch his final construction. The machine is a biplane, the planes of which measure 41 feet by 6 1-2 feet.

The frame-work is built of Shelby steel tube, fitted together with light alloy castings, and bolted with specially designed forged iron bolts. High tensile steel wire with patent turnbuckles is used for trussing. It has a sixteen-foot extension in front which carries a twelve-foot by twenty-eight-inch biplane elevator, together with a similar extension at the rear on which is fixed a rigid tail of four surfaces, two vertical and two horizontal. It has no rudder, but lateral stability is maintained by two methods, one being a patent of the inventor which he calls a retarder, and which consists in a system of vertical sliding panels (which operate somewhat on the principle of a window shade), one being located on each side of the machine, between the main planes. The other method is that of an electrically controlled gyroscope which works in conjunction with the radiator.

The machine is mounted on wheels and is also equipped with two hydroplane floats to "land" on water. A Whitehead motor of 75 h. p. is to drive a propeller of eight feet six inches diameter and eight feet pitch.

Mr. Lawrence has recently formed a partnership with Gustave Whitehead, who is the designer of the Whitehead engine, for the purpose of putting it on the market.

The motor is made in two sizes, 40 h. p. and 75 h. p., the latter weighing 200 pounds and the former 145 pounds. Both are equipped with thrust bearings, eliminating the danger of breaking the crank shaft, where a propeller is fixed direct to the shaft.

No carburettors are used, a vaporizer being attached to the gas chamber of each cylinder, which thus becomes a distinct engine in itself.

The four vertical cylinder engines are of the two cycle type, and the disposal of the valves is claimed to be conducive of great power.

The cylinders are of nickel-steel, the pistons of cast iron with four rings.

Messrs. Whitehead and Lawrence claim that the power actually developed by this motor is much higher than the rating, and are prepared to back their claim up with a guarantee.

According to an announcement made by the Aviation Committee, San José, Cal., is to have an aerial exhibition on May 14th and 15th during Rose Carnival week. Six aviators have been engaged to make flights. The presence of some dirigibles is also assured.

The free use of a flying field in Los Angeles, which has a perfectly level course of several miles, has been offered the War Department for manœuvres with the army aeroplane. As the site available at Los Angeles will allow flying over Santa Monica Bay, it would be possible to carry out experiments in cooperation with the cruisers of the Pacific Fleet.

While flying at the Wrights' practice grounds at Montgomery, Alabama, recently, Orville Wright had to glide to the ground from a height of 100 feet. Both driver and his machine landed safely.

This was the first flight made in America by Orville Wright since his famous cross-country flight from Fort Meyer to Alexandria on July 30th last, and the first he has made anywhere since flying in Germany last Fall.

The city of Tacoma, Wash., had its first glimpse of a human bird when Charles K. Hamilton flew around the Athletic grounds, where the exhibition was being held. He made several spectacular flights and reached an altitude of 1,000 feet, remaining in the air from seven to ten minutes. In his final flight, when at a height of about 900 feet, and with his engine at top speed, he dived down to within 50 feet of the earth, when suddenly, he again glided upward, just missed a fence, and flew away over the heads of the spectators, returning after a two-mile flight over the city.

The International Balloon race in October has been assigned to St. Louis, but the progressive city also wishes to have the international aviation meet, and with this end in view The Aero Club of St. Louis has obtained an option on the old Union Race track. In case the club is not successful in getting the international flying meet, it will, in all probability, secure the grounds for exhibition flights.

In view of the great possibilities of the gyroscope as an automatic balancer of flying machines, it is interesting to note the attention being given by inventors to this remarkable instrument, which, up till lately, was mainly looked upon as a toy. Among those attacking the problem of gyroscopic balancing is Mr. Chas. E. Dressler, whose electrically operated gyroscopes are at present being much discussed by experts.

The following interesting letter from a famous navigator of the skies was recently received in New York:

Vancouver Hotel, Vancouver, B. C.,
March 29, 1910.

Dear Friend:—I received your kind letter of March 15 to-day. It has been quite a time reaching me, as it got to each city just after I had left.

Yes, I had quite an accident in Seattle—had the calf of my left leg nearly torn off, struck my head against an ash pole, which put me in the land of dreams for a couple of hours. Since then I have been walking around with a cane and an umbrella, but flying every day.

Yesterday I made a cross-country flight to New Westminster, going over the city and returning to Vancouver. I ended the flight by shutting off the motor and making a glide of a little over a mile in length from a height of about fifteen hundred feet. From the time I shut off the motor until I reached the ground the newspaper men timed it, and the glide lasted one minute and eight seconds.

Have you seen Mr. Curtiss or Captain Baldwin lately? And what are you and all the other birds doing around New York?

There is one thing about aeroplaning—you can fly at a stated time regardless of the weather, rain, snow or wind included.

With best wishes, I am,
Sincerely yours,
CHARLES K. HAMILTON.

It will be noted that Hamilton considers himself far less dependent on the weather since he has given up piloting motor gas-bags for driving a Curtiss biplane.

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DISCOVERED something which has a greater lifting power than hydrogen, the lightest known element. Will divulge the long-looked-for knowledge to party with capital, interested in U. S. Patent 939,651, which has directly opposed aeroplanes united together and having a body mounted for tilting movement between said planes, a propeller at the forward end of the body, adjustable for steering purpose, propellers arranged centrally within the planes for rendering momentum, means operating the said propellers in unison; a tail piece for steering if the motor gives out, means of forming a ball and socket connection between the tail piece and the rear end of the body.

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NOTICE TO THE PUBLIC.—This notice is to make public a new invention in rudders for flying machines. This invention was communicated by me on March 8, 1910, to several parties. My invention consists of a rudder divided into four parts, at the rear of the machine, two parts on the right side and two parts on the left side; the two parts on each side hinged top and bottom and each part set at an angle and the parts on either side set at opposite angles. When not in use each part lies flat. They work from horizontal to vertical by means of connections extending forward in the machine. Joseph Thebeau, 315 West 51st Street.

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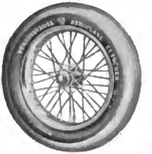

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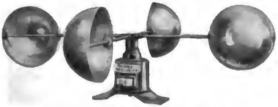

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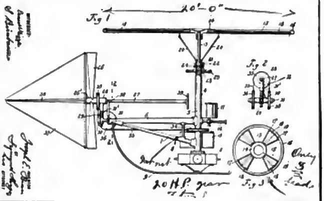

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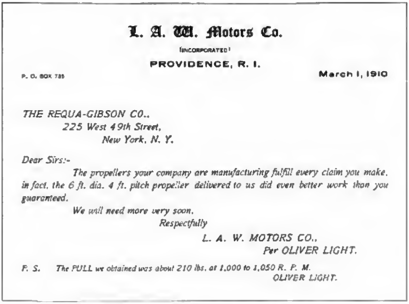

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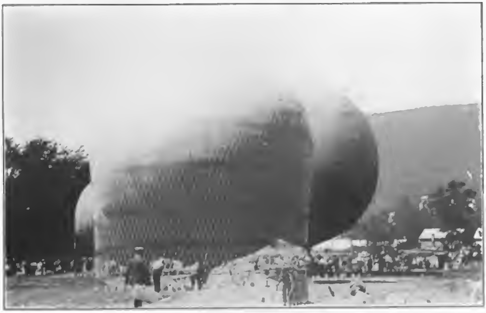

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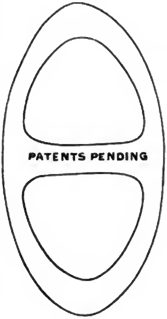

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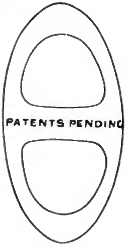

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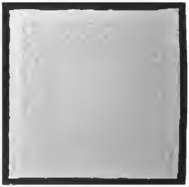

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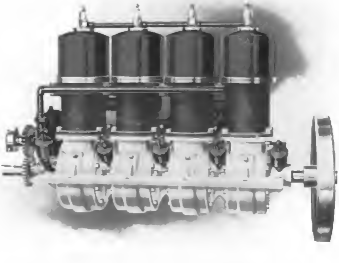

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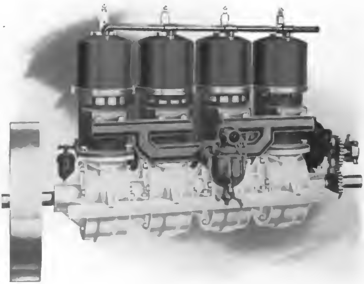

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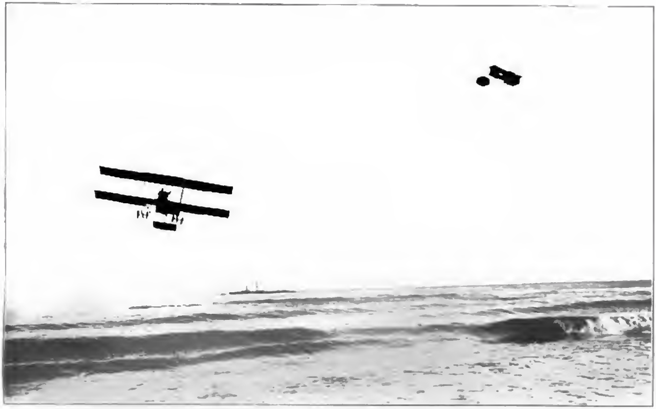

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AIRCRAFT

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SUMMARY OF HUMAN FLIGHT

By Mrs. J. Herbert Sinclair

(Continued from May AIRCRAFT*)*

ALTHOUGH it seems that the lineage of the Zeppelin dirigibles is an unbroken one and that each big ship was followed by an improved successor, there was in reality an interval of several years between the building of the first of the great rigid airships and that of the second.

In this interval others were experimenting, however, more especially in France, where Santos-Dumont was continuing his first experiments, and where his dirigibles were succeeding each other with bewildering rapidity.

Whatever may be said of the lack of scientific value or usefulness of the daring Brazilian's experiments, it is certain that none have ever called forth the popular enthusiasm or drawn public attention to the possibilities of aeronautics, as they did.

It was the Santos-Dumont VI which won the famous prize of 100,000 francs, offered by M. Deutsch (de la Meurthe) to the first dirigible which should rise from the grounds of the Aero Club of France, at St. Cloud, near Paris, and, under its own power, circle the Eiffel Tower, three and a half miles away, returning to the St. Cloud grounds, within half an hour.

After two unsuccessful attempts in July, with the No. V, the feat was performed on October 19, 1901, with the new No. VI; it will long be remembered by the countless thousands of Parisians who witnessed it.

The start occurred at 2.42 in the afternoon; the wind being favorable on the outward journey, the Eiffel Tower was reached in nine minutes and the turn successfully made.

The return trip against the wind, notwithstanding motor trouble and loss of lifting power when passing through the cool air above the Bois de Boulogne, took but twenty minutes, the finish line being crossed twenty-nine and a half minutes after the start; the rules prescribed, however, that the time should be taken at landing, and it was forty-one seconds over the half hour before he had doubled back after crossing the finish line and landed. The prize was, however, not withheld on this technicality.

Of Santos-Dumont's later dirigibles, the most interesting certainly was his tiny No. IX, of 1903. Small dirigibles are an anomaly, but this little gas-bag, with its diminutive engine, did sterling work for its designer and owner.

Santos-Dumont named this the "Runabout" and used it as such. One day he made a trip to the Aero Club grounds, and after a short call started off again, recrossed the Seine and stopped for refreshments at the restaurant of the Cascade; he crossed the river twice more before returning to his own grounds.

On another occasion he actually sailed up the Avenue du Bois de Boulogne on a level with the roofs of the houses, and down that of the Champs Elysées to his own apartments, where he had breakfast. Another day he allowed a young American girl to navigate the little craft from Neuilly St. James to Bagatelle; the No. IX also carried Santos-Dumont to the annual Military review of the Fourteenth of July, at Longchamps.

Santos-Dumont had many remarkable escapes from death in the course of his daring trials, but a compatriot of his was less fortunate than he, and met his end under most tragic circumstances.

Severo d'Albuquerque and his friend Saché rose into the air on May 12, 1902; their craft was a dirigible of most peculiar shape and design, the gas-bag of about 85,000 cubic feet capacity being sustained by an inner framework, and the two propellers being placed at the ends of the longer axis of the bag itself.

A quarter of an hour after the start, flames were noticed at the back of the car and a violent explosion followed. Immediately after this a bright flame was seen in the middle of the lower side of the main body and another explosion took place. The balloon fell from a height of 1,300 feet, and Severo and his companion were killed on the spot. It was subsequently found that the gasolene tank showed signs of having been on fire, and the whole of the car was more or less burnt.

The fault lay in placing the car too close to the body of the balloon.

The explosion must have originated at the motor: the flame was then carried along the chimney and came in contact with a stronger explosive mixture with the result that a second explosion took place. The balloon then crumpled up, and as the outer envelope was not firmly secured, it did not act as a parachute, the fall being in consequence very rapid

1902 was a most unfortunate year for dirigible-fatalities, the death of another experimenter and his aide following the Severo accident, on October 13; these were Baron de Bradsky-Laboun and a young engineer named Morin.

The dirigible was 112 feet long and of 30,000 cubic feet capacity.

When de Bradsky made his ascent, one of the propellers caused a tilt about the vertical axis, and a much greater height was reached than had been expected.

De Bradsky seemed to be about to give up the attempt, and began to descend. When he was about 300 feet from the ground, he called for information as to a suitable landing place. As soon as he had satisfied himself about this point, it was noticed that Morin moved toward de Bradsky, and the centre of gravity was shifted to such an extent that the car toppled over. Both aeronauts were thrown out and killed on the spot.

In the history of aeronautics, more perhaps than in that of any other art, successes have been built on failures, and failures have had a most potent effect on its development.

The deaths of Severo and of de Bradsky—martyrs to science—were deplorable in every way, but from their accidents much was learnt as to what should be avoided in dirigible construction.

No further fatalities were to occur in bonā fidē dirigibles for seven years

(To be continued in July AIRCRAFT*)*

WOMEN WHO FLY

By Ada Gibson

IT was not without some surprise that the success of the Baronne Raymonde de Laroche, at the recent flying contests held in Egypt, was learned of in America.

Throughout the winter some news and much rumor had crossed the Atlantic concerning the efforts being made by some venturesome sportswomen to emulate the prowess of Continental aviators, but it remained for the Heliopolis meet to reward this perseverance, and to prove beyond doubt that the joys of driving a flying machine were not to be reserved to the sterner sex.

MISS DOROTHY LEVITT, OF LONDON

Mme. de Laroche was the first woman to pilot an aeroplane in flight; this feat she achieved as long ago as last November, at Mourmelon—that human aviary, where, throughout the last few months, so many would-be birdmen have graduated from the fledgling class.

She was by no means, however, the first of her sex to experience the novel sensation of flying, for many before her had soared aloft, as passengers of the more experienced aviators.

To a Flemish girl, Mlle. P. van Pottelsberghe, of Ghent, belongs the distinction of having flown before any other woman; this occurred just two years ago when she rode by the side of Henry Farman, on his famous old Voisin biplane.

He had come to Belgium to make the first exhibition flights ever given by an aviator and on one of his trials the young Gantoise was taken along as a lightweight passenger: the machine only severed contact with Mother Earth for a few yards or so and did not rise more than two or three feet, but during those brief instants it certainly was flying.

A few days later, but in a widely different location—at Turin—another Voisin, piloted by poor Léon Delagrange, carried as a passenger for some few hundred feet, the French sculptress, Madame Thérèse Peltier; Delagrange, it will be remembered, was himself a sculptor of no small merit.

It was announced at this time that Madame Peltier was to learn to drive the biplane but she apparently abandoned the idea, the death of Delagrange having no doubt much to do with this decision.

The honor of being the first woman to fly on a Wright machine and the further dignity of being the first lady passenger of Wilbur Wright himself belong to Madame Hart O'Berg, whose husband was Wright's European business manager. It was on October 7, 1908, that she flew with him at the military parade grounds of Auvours, near Le Mans, where he had recently been astonishing the world with his demonstration of mechanical flight, and, the next day, another lady experienced the delights of flying in the same machine, driven by the same master hand; this was Madame Léon Bollée, whose exhilarating air-trip lasted just four minutes and twenty-one seconds. Léon Bollée is of course the well-known automobile manufacturer of Le Mans, and it was in his workshop that Wright assembled his machine for the reception-trials made before the French Syndicate.

Madame Lazare Weiller, the wife of the Parisian banker, who was then negotiating for the purchase of the Wrights' French patent rights was his next—and for a considerable time his last—lady passenger, for it was not until the Spring of 1909 that the preserves of these ladies were encroached upon by the Comtesse de Lambert, the wife of Wright's first pupil, and by Miss Katharine Wright, the aviators' sister; these ladies made several flights at Pau in the famous flyer.

Several women in America have also temporarily left the earth for a brief space of time, as passengers in flying machines; Mrs. Ralph H. Van de Man took a short trip in the Army Wright aeroplane; this was at College Park, near Washington, last October, with the elder Wright once more at the helm; no other lady has flown in a Wright in this hemisphere, but several flew with Paulhan in his Farman during the Los Angeles meet, last January, notably Mme. Paulhan, Mrs. Clifford B. Harmon, Mrs. Cortlandt Field Bishop, and Mrs. Dick Ferris.

Mrs. Van de Man, the first lady in America to fly, is the wife of one of the Captains of the Army War College, and her great ambition is said to be to become a competent aviator; no one who has seen this daring rider of thoroughbred jumpers taking the obstacles in the hunting field will doubt her capability to master this latest strenuous sport. Mrs Glenn H. Curtiss is another American who has recently flown; it goes without saying that this was with her famous husband—the winner of the Gordon Bennett Cup—on one of his swift little biplanes.

MADAME THÉRÈSE PELTIER, ON THE LATE LÉON DELAGRANGE'S FIRST AEROPLANE

In Europe there are many women who have soared in flying machines since the beginning of last Summer, as passengers of renowned aviators; among these are Madame Colliex, whose husband is the Voisin brothers' head engineer, and who, nearly a year ago, was one of the "men" in the first "three-man-flight" ever made. Mme. Frank was one of Farman's passengers in the world's record *one hour* three-man-flight, which he made quite recently; this is the longest flight ever made by a woman; Miss Gertrude Bacon, another passenger of Farman's, is one of the very few women who has been so favored as to have experienced all the different methods of air-travel: her interesting impressions appear elsewhere in this issue.

Then there is Mlle. Jeanne Laloë, the lady-journalist who flew several times last October, on Brégi's Voisin; there is also Mme Anna Warchalowski: she is an Austrian—the first Austrian woman to fly,—and the only woman to have flown so far, in Austria; she is the sister-in-law of Adolf Warchalowski, to whom she is indebted for her trip skyward.

In the last few months a great many of the passengers of the more famous flyers, especially in France, England and Belgium, have been women, so many in fact that an enumeration of them would be fastidious.

Among the first women of title to take up the aerial fad,—(every new locomotion must apparently pass through the stages of science, sport and fad, in the order named, before becoming a world-wide industry)—are the Comtesse de Guittant and the Princesse de Croy, who were recently Sommer's passengers at Mouzon.

Mr. Claude Grahame-White, the hero of the first attempt to win the $50,000 London to Manchester prize, took his mother for an air-spin over the Chalons plains the other day—certainly the first time mother and son have flown together—while in a recent "three-man-flight" at Mourmelon, the fair sex preponderated aboard the flyer!

As to the bonā-fidē women aviators, those who drive their own machines, it was not until the end of last Summer that the Baronne de Laroche, who as mentioned above, is the pioneer of them all, took the first lesson in handling her Voisin; it did not take this well-known sportswoman and automobilist very long to become mistress of her new craft, and only a few weeks later found her making her first flights. She has since made many, remaining at times aloft for half an hour at a stretch. Nor have these been accomplished without incident: she sustained one very bad accident last Winter, but, with characteristic determination, resumed her trials as soon as she had recovered from the fall.

MLLE. LALOË, ABOARD BRÉGI'S VOISIN (THE IDENTICAL BIPLANE ON WHICH PAULHAN ACHIEVED HIS EARLY TRIUMPHS). BRÉGI IS HIDDEN BY THE CLUB PENNON

THE BARONNE DE LAROCHE, THE FIRST WOMAN TO PILOT AN AEROPLANE IN FLIGHT

While Madame de Laroche originally took up flying as a sport, her try-out at Heliopolis against some of the most famous professionals proved such a success that she has entered for several of the many European meets.

Several other women are adopting the new art as a profession: such are Hélène Dutrieu and Aboukaïa, two feminine professionals who have already achieved fame in various pursuits calling for especial daring and initiative. The former, as a professional cyclist, was famous a dozen years ago; she won the world's championship for women, held at that time, and still holds the world's hour record for her sex; when the interest in racing waned she took up trick riding and some of the more dangerous circus specialties, such as "looping the loop," a pursuit which nearly cost her her life; Hélène Dutrieu has since achieved success as an actress but is now returning to the excitement and danger of professional mechanical sport; she has already flown in a Santos-Dumont "Dragon-fly" and sustained a bad spill without harm or even emotion; she will shortly fill an engagement in Russia where she will appear on a Sommer biplane.* Mlle. Aboukaia was also a professional cyclist at the time of the bicycle craze, and was a familiar figure at the races held at that time on small indoor saucer-tracks, in London; she is a very small woman and now drives a diminutive Santos-Dumont monoplane.

These are out and out professionals and look on flying as a matter of business; Mademoiselle Marvingt, on the other hand, is a sportswoman pure and simple; famous as a horsewoman and as a swimmer, she has also earned the reputation of being one of the cleverest balloon pilots in the world and her recent hair-raising crossing of the North Sea is one of the most daring feats in the annals of aerostation.

This plucky Frenchwoman is also an adept at the thrilling Norwegian sport of skiing; she recently won the ski races for ladies, both at Chamonix and at Gerardmer, with little or no effort.

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*A photograph of Miss Dutrieu as a passenger of Sommer's occurs on page 146

She has now taken aviation into her affections and has made many flights with Latham on his Antoinettes; her great ambition being to drive an Antoinette which, if it is one of the hardest of aeroplanes to learn to master is also the most bird-like of them all.

Although American women have not up to the present become sufficiently enthusiastic to take up the new sport in earnest, they must not for a moment imagine that the field has been left entirely to Frenchwomen.

Miss Dorothy Levitt, of London, whose successes on the stage are only second to those she has achieved as an expert automobile race-driver, made her first flight as a passenger of Paulhan, at Blackpool, and so enthusiastic did she become that she immediately went to Chalons to learn to drive an aeroplane. She made arrangements to come to America and exhibit her skill as an aviator at the Los Angeles aviation meet, but was deterred from doing so, through not having obtained her pilot license.

Some Irish women, too, have added flying to their other pastimes, and in some instances are perhaps more actively enthusiastic than their French sisters. One of them at least, Miss Lillian S. Bland has constructed a machine entirely herself; Miss Bland has christened her aeroplane "Mayfly" and believes it was the very first biplane to be built in the Emerald Isle.

MADEMOISELLE MARVINGT TAKING A LESSON FROM HUBERT LATHAM IN HANDLING AN ANTOINETTE MONOPLANE

Judging from the success obtained with this machine as a glider it might have appropriately been re-christened "Doesfly," by its modest owner.

Other ladies from Ireland interested in aviation are Miss Sheila O'Neill and Miss Spencer Kavanagh. The former has been learning the intricacies of managing a flying machine of entirely novel design, at Wimbledon, near London, and dreams of nothing less than crossing the Irish Channel in it, while the latter, who is an expert balloonist and parachutist, is a pupil of Mr. Grahame-White. She has been serving her apprenticeship at Pau and has made several flights on her "Channel-crossing" Bleriot. She was the first woman of British nationality to pilot an aeroplane.

Both Miss O'Neill and Miss Levitt, as well as Miss Gertrude Bacon, are members of the English Women's Aerial League, who have been giving a series of "aerial teas" at the Criterion Restaurant, London, where music intersperses, and tends to relieve whatever tedium or dryness accounts of aeronautical experiences and speeches on aeronautical topics may present to feminine ears when served as a steady diet!

Other ladies now learning to fly in France are Lady Campbell, on a Blériot, Misses Anna and Rosa Stier, of Austria, on Voisins, and Mlle. Elsa Béchart, also on a Voisin, (the latter at the new Sanchéz-Besa flying school, near Reims).

DIMINUTIVE MLLE. ABOUKAÏA ON AN AEROPLANE TO MATCH: A SANTOS-DUMONT "DRAGON-FLY"

In Germany, Fraulein Ida Perry, well known to Berlin theatregoers, has ordered a monoplane from Hans Grade, the famous German aviator, who recently came to grief at the Nice meet, but who, on the whole, has been remarkably successful with his racy little flyer.

About the only women in America who have announced their determination of driving an aeroplane are the Misses Curzon, of New Orleans, whose brother purchased one of the prize-winning Henry Farman biplanes after the Reims meet.

More will follow in the tracks of these aerial amazons and if precedents count for anything, there seems no reason to doubt that, when the sport develops, quite as many and as competent feminine aviators will be found to the West of the Atlantic as to the East.

A GROUP AT THE BLÉRIOT FLYING SCHOOL AT PAU. IN THE CENTRE MISS SPENCER KAVANAGH; ON HER RIGHT, CLAUDE GRAHAME-WHITE, THE HERO OF THE FIRST ATTEMPT TO WIN THE LONDON TO MANCHESTER $50,000 PRIZE

EDITORIAL

TO THE WORLD AT LARGE inured to scepticism by centuries upon centuries of unsuccess, the idea of successful and efficient travel through the planet's atmosphere, instead of on its surface—terreous or aqueous—is distinctly a revolutionary one.

It is the role of this magazine to contribute an earnest and fruitful share towards making this at present startling idea a familiar one, and to record, month by month, the progress and the extension of aeronautics throughout the world.

It is an eminently encouraging task at this time. Only three years ago the mention of aerial navigation still called forth open derision—and the writer, among others, can vouch for this—; a year later this had "toned down" to a sceptical smile; last year interest began to be genuinely felt,—it was still amused interest, but interest, nevertheless—; and now amusement has no further part in the interest, whether it be casual or intense, manifested by the individual in the present developments and prospects of air-craft as instruments of human usefulness.

Thus, in three years, has been accomplished for aircraft what took thirty years for the steamboat, twenty for the steam-engine, and ten for the automobile.

In Europe, however, "l'idée aérienne" has made far more rapid strides than in America.

In taking up a new idea, Americans may be said, generally speaking, to be all more or less "from Missouri"; they do not let themselves be carried away by enthusiasm or sentiment; scepticism and suspicion of "new fangled ideas" are in fact among the most valuable stocks-in-trade which go to make them the business men of the world par excellence.

It is therefore, perhaps, too much to expect that this necessary change in point of view, as concerns aerial navigation, should be brought about with such revolutionary rapidity as it has been in the Old World; but, through being more evolutionary in character, the change is all the more definite and all-embracing, and when it is ultimately consummated no relapses of incredulity occur such as a too rapid change of ideas almost invariably brings about. The people of this country may be a little slower in drawing their conclusions, but when these are arrived at they are liable to be both more permanent and more correct.

But quickly as the idea is gaining ground among the masses, it is not keeping pace with the events which prompt it; not a single day passes—one single day in the world's history—that a new fact, a feat, a record, a performance, or a discovery, an invention, a new idea, is not recorded, to be added, as a single stone, to the ever-growing tower of aeronautical knowledge and achievement.

Take the events of a single month:

A month ago for an aeroplane to risk itself over the sea was considered a deed of heroic recklessness: the other day ***eight*** aeroplanes soared out over the blue waters of the Mediterranean on a single afternoon.

A month ago to fly from one spot to another fifty miles distant was still a dream of the future: to-day such a flight would probably not be deemed of sufficient interest to warrant the cost of cabling the news.

A month ago the Comte de Lambert's feat of last October was still spoken of as a marvel among marvels: a young man with six weeks' practise at driving a bran-new type of monoplane—a monoplane, let it be noted—duplicates this feat, soars over Paris, and lands in the Bois de Boulogne; three lines are cabled on the event, and the next who accomplishes a similar performance will no doubt pass unnoticed.

A month ago a three-man flight was considered a marvellous weight-carrying feat; what would it be thought of now that Sommer's machine has carried four aloft for several miles?

It is only a few weeks since the winning of the $50,000 of the London "Daily Mail" and that of the $20,000 of the Michelin brothers were deemed mere possibilities of the dim future; the former is now won, and it is obvious that we may expect the other to be attempted any day.

Here in America a short news-despatch tells us that one man has taken another, as a passenger, up five hundred feet, and that a second native aviator flew at nine hundred feet. Let us imagine for a moment the sensation this would have created had it occurred on April 23, 1909, instead of on April 23, 1910!

And so it goes, the exceptional of yesterday is merely the unusual of to-day, before becoming the familiar of to-morrow.

LETTERS FROM SIR HIRAM MAXIM, BLERIOT AND ESNAULT-PELTERIE

WE recently wrote to Sir Hiram S. Maxim, the famous inventor, to M. Louis Blériot, the well-known French aviator and builder of monoplanes, (which were recently declared to be infringements of the Wright patent) and to Mr. Robert Esnault-Pelterie, President of the Syndicate of the aeronautical constructors of France, for their points of view on the Wright question, and have received in reply the following letters:

SIR HIRAM MAXIM'S LETTER

Dear Sir:

I have read with a great deal of interest the correspondence and editorials which have appeare' in AIRCRAFT relating to the Wright patents in America.

To make the front edge of an aeroplane rigid and the rear edge thin and flexible and to keep the machine on an even keel, by flexing the thin edge, is certainly not new.

Lord Kelvin took a keen interest in my work at Baldwyn's Park: he visited my place on many occasions and brought some very distinguished scientists with him. He spoke very highly of my work but he had his own ideas and in time these ideas may be proved to be right. He thought it would be possible to make a machine in which the aeroplanes, although very large, could still be revolved at a low speed, the machine moving forward through the air the same as at present. I thought the matter over and it appeared to me to be quite plausible and I ultimately applied for a patent on a flying machine having eight aeroplanes mounted on two shafts. These were to be placed at a very low angle, to rotate slowly to get their lifting effect principally from being driven forward onto undisturbed air.

The machine took the form of both a helicopter and an aeroplane. This patent is referred to in my book "Artificial and Natural Flight." It can be seen that it is claimed as an aeroplane as well as a helicopter and the flexing of the outer and rear edge of the aeroplanes is certainly shown and described and is used for keeping the machine on an even keel. In fact the flexing aeroplanes represent the pith of the whole patent.

The law relating to patents is not by any means a fixed quantity. There are many factors in the equation and the strongest factor in the Wrights' favor, in the United States, is, without doubt, the factor of patriotic bias.

Everyone who has anything to do in the decision will naturally have a strong bias; they will even strain a point to give the credit of the invention of a flying machine to an American: I have no doubt, however, that a determined effort on the part of American aviators, if supported by money, would be quite able to greatly curtail the preposterous claims made by the Wrights.

I was present at the Rheims meet last year and I noted what people had to say; it generally amounted to this: "The Wright machine has had its day; it is now a back number." Whether this be true or not the Wrights are certainly entitled to very great credit for the part they have played in the history of aviation.

With the money that they have at their disposal they may be quite able to greatly retard the progress of aviation in the United States, but in Europe I do not anticipate that they will be able to give aviators any trouble whatsoever unless these aviators use the *specific* device of the Wrights, as described in their patent.

Yours sincerely,

Hiram S. Maxim

BLERIOT'S LETTER

Dear Sir:

Concerning the Wright patents my opinion is that the warping of the wings, taken in itself, is public property, and I think this can easily be shown: the vertical rudder is itself public property and it is only the combining of these two effects—balancing and steering—in a single lever of control which can with some show of reason be claimed by the Wright brothers.

I have personal reason to regret that they did not confine their claim to this single lever, for it is an interesting improvement and one concerning which we could have established with the Wrights an understanding, which would have been of profit to all aviators.

In all my present French machines the warping of the monoplane surface is brought about by the left hand, while the steering is dependent on foot control. These two effects are completely independent and in no way necessarily corrective, as called for in the Wright patents; on the contrary experience shows that the major part of the time their effects should be added one to the other instead of corrective of each other. This independence of control necessitates a somewhat more delicate and longer apprenticeship, but one which the present uncompromising attitude of the Wrights forces me to maintain.

I have gone further; in view of their threats I have tried to completely do away with warping, using only for balancing purposes a somewhat larger vertical keel. The result was entirely satisfactory; I was in this manner able to fly without warping, in winds as strong as those faced by the Wrights.

I delivered to Paulhan two such machines for his American trip and, in his trials at Pau, prior to leaving France, he flew perfectly without any warping device. He made as sharp turns as previously and merely had to use a greater tilt, when doing so.

To sum up, this question of warping, about which so much fuss has been made, and which seemed to be a *sine qua non* condition of lateral equilibrium, proves to be of far less importance than this. If warping renders signal service in keelless machines of wide wing area, such as the Wright machines, it becomes a far less necessary improvement in machines of small breadth of wing, provided with keels, and is entirely needless in machines with vertical partitions, such as the Voisin biplanes.

As aeroplanes will tend more and more toward increasing speed and diminution of breadth of wing, the question of warping will more and more lose its importance.

I merely wish to say that it was regrettable to see at the dawn of a science, (to encourage which all should have united in their efforts) inventors make the unjustifiable claim of monopolizing an idea, and, instead of bringing their help to their collaborators, prevent them, for no reason, from profiting by some ideas which they should have been happy to see generalized.

L Blériot

ESNAULT-PELTERIE'S LETTER

Dear Sirs:

I duly received your letter of the 18th inst., and sincerely thank you for the impartiality which you are good enough to show in the question of the Wright patent.

I can only repeat what I have already said, that I consider the judgment rendered against Paulhan unjustified. As regards the practical result of the action of the Wright brothers, it has been that we have joined together on the continent and taken measures to eventually have justice rendered to us in our country. We will also try to reach this result in America. It is true that the precedent of the Selden affair is unfortunate and tends to make one doubtful of success, but we are decided that, if we do not succeed on judicial territory, we will take up the conflict on other lines.

I remain, yours very truly,

R Esnault Pelterie

SAFE FLIGHT

By James S. Stephens

SAFETY in flight has acquired a new interpretation with the advent of the flying machine. This phrase, which previously meant to run away, now means to stay, or staying power, steadiness, equilibrium, as applied to the art of flying.

Flying is an art the broad possibilities of which have as yet only been dreamed of. The wonderful developments of the past few years have been to a great extent but practical demonstrations of the theories and plans of would-be man-birds, for hundreds of years past, made possible by the invention and improvement of the gasoline engine. To "fly" has been the first aim of all who in the past have devoted their time, their talents, and sometimes their lives, to the subject. This aim having been accomplished, it now devolves upon those who are giving their thought and time to the matter to work for improvement of methods. Safety and service should be the watch-words of future progress.

To a great extent safety will always be a question of stability and control. Many inventors are now working along this line. Swinging weights, gyroscopic action, air or hydraulic pressure, and electrically operated devices have been proposed, any of which might be used singly or in combination to operate the controlling functions of a flying machine, applied either directly or as auxiliary regulators.

The application of many of these devices at present in use for other purposes, would be a simple matter. It has been taken for granted that such devices must be made to operate the controlling methods in use. All of these devices require a considerable amount of power, in fact with the Wright method of wing-warping, and the swinging of the hinged surfaces as in the Farman and Curtiss machines, the more critical the conditions become under which they are used to return the machine to its normal position the greater the power required. There is always the imminent possibility that the operator or auxiliary apparatus may not possess sufficient strength or leverage promptly to accomplish the desired effect—with an accident as the result.

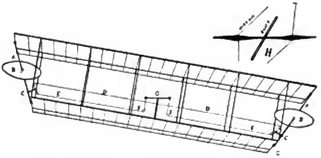
This feature of requisite power renders present methods of maintaining stability inefficient and but poorly adapted to control by automatic apparatus, resolving the problem into the supplying of some other and better method than the warping or swinging of unbalanced surfaces so as to oppose them to the lifting pressure of the air by sheer force.

The writer believes that the greatest improvements can be made by a design which will so locate the supporting surfaces relative to each other and to the weight carried that they will co-act within themselves. Such a machine normally will have the necessary inherent stability, either when flying under power or when soaring with power shut off.

This disposition of the supporting surfaces should be so made that no vertical surfaces other than those made necessary by the details of construction shall be used. Only such dihedral angles should be utilized as may be required to obtain the necessary inherent stability, no greater angles from the horizontal being used under normal conditions than the angle of incidence of the planes or aerocurves necessary for support. This method eliminates the vertical rudder and all vertically disposed surfaces, which the writer is confident, notwithstanding the recently reported successes of the Voisin machine, as flown by Rougier at Monaco, will be found objectionable and dangerous.*

The perfected machine will of course need provision for steering by the operator, as well as provision for supplementary control of longitudinal and lateral balance, which, in this case, would come more properly under the head of steering, since the steering of a flying machine contemplates turning to the right or to the left as well as ascending or descending, while the balancing calls for the maintenance of the machine on a level, longitudinally and laterally.

The cut here shown illustrates a method wherein is utilized a principle undoubtedly new for this purpose and eminently adapted to meet the requirements outlined in this article.



In a biplane-construction an inclined shaft A is journaled in ball bearings on the ends of each plane; midway between the planes on this shaft a circular plane B is attached and supported in a normally horizontal position by suitable wire guys. An arm C projecting at a right angle from the lower end of each shaft, has a flexible wire connection D, from one to the other on one side, while the connection on the other side E, passes up through pulleys F, to a rocking arm G. Any movements of the ends of this arm up or down will rotate the shafts A, tilting one of the circular planes up and the other down, giving a lifting effect on one side and depression on the other, the rocking of the arm G being a natural movement in opposition to the tilt of the machine.

These plans are of circular form and in section as shown at H, this form and section presenting a sharp edge to the air as it meets and leaves the surface and at the same time providing a concave surface on either side, thus greatly adding to their efficiency.

A practical demonstration of the operation of this device may be made by mounting two circles of card-board, six inches in diameter, on two lead pencils, placing them at angles as shown, and turning the pencils slightly in either direction.

These circular planes will undoubtedly prove as efficient as any method heretofore used and will have the great advantage of operation without resistance other than the slight friction to overcome, which may be regarded as negligible, making it much easier to maintain manual control and possible to use any of the means of automatic or auxiliary mechanical controls that have been suggested.

This same principle as shown for maintaining lateral balance has been utilized in a different form for steering in any desired direction and incorporated in a machine now being constructed to demonstrate the views herein set forth. The entire control of this machine is governed by the movement of the single handle-bar G.

Patents have been applied for covering the principle of this device and its various applications, as also upon details of construction for the various purposes for which it is proposed to use it. It is the intention of the writer to submit for publication at an early date drawings and a complete description of the machine referred to, inviting the criticism of the rapidly increasing number who are interested in the Conquest of the Air.

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* Ed. Note. The Voisins are now building biplanes without vertical partitions. See page 146, 3rd column, and page 148.

BIG MEN OF THE MOVEMENT

ROBERT ESNAULT-PELTERIE

ROBERT ESNAULT-PELTERIE is one of the new school of brilliant young French engineers who have been seized by the fascination of the problem of flight and are devoting all their energies towards completing its solution.

As President of the Syndicate of French Aeronautical Constructors he holds a very high position in the "aerial" world, a very natural one, for him, considering his talents, but somewhat surprising if his youth be considered, for M. Esnault-Pelterie was but twenty-nine years of age on November 8th last.

Educated at the lycée Janson de Sailly, in Paris, he has the degree of "licencie ès-sciences."

Even during his early youth Esnault-Pelterie was deeply interested in scientific questions, and his room was littered with mechanical toys of his construction.

When he heard of the first experiments of the Wright brothers, he was fired with the ambition to emulate them.

He took up the study of aeronautics and especially of the application of the gasolene engine to flying machines. It was thus that he came to build his famous "R.E.P." motor, which he fitted to a monoplane of his own design early in the Fall of 1907. His first flights were made in October of that year and excited a great deal of comment, as much because of the novelties in the design of the motor as because of those which characterized the monoplane itself.

The wings could be warped, a peculiarity which no French aeroplanes of that time shared, and because of this the machine steered much better than the others being experimented with in Europe, in fact Esnault-Pelterie may be said to have accomplished the first voluntary deflections from rectilinear flight, made in the Old World. The length of these flights or hops did not exceed 500 feet, however, and it was only in the following year that he succeeded in flying three-quarters of a mile, temporarily holding the world's record for monoplanes.

Esnault-Pelterie machines have recently made flights of ten minutes, but they are still somewhat hard to handle, the inventor retaining certain features which he hopes, when improved, will make his machine superior to others, but which in their present form appear to handicap the craft.

The "R.E.P." motor has been often described; it is built in four sizes or powers and embodies five, seven, ten or fourteen cylinders, disposed fan-shape, around the crank case; both design and construction are of a highly original character.

As a leader in the aeronautical movement, Robert Esnault-Pelterie stands as high as any; it was virtually he who organized the first aero shows in Paris, in 1908 and last year, and it was due to his untiring zeal and energy that they were such an unqualified success.

LOUIS BLERIOT

LOUIS BLERIOT, the hero of the "Channel Crossing" and the famous French builder and driver of monoplanes, was born at Cambrai, July 1, 1872.

He graduated from the Ecole Centrale des Arts et Manufactures and as early as 1900 was tackling the problem of mechanical flight. His first attempt, like that of many other pioneers, was an ornithopter or flapping-wing machine. Discouraged by the failure of this premature effort, he turned his attention to the automobile industry, and put on the market the famous acetylene headlights which bear his name, and the great sale of which enabled him to later spend so lavishly on his aviation experiments.

In 1903, when Ernest Archdeacon led his campaign of propaganda in France, Blériot was one of the first to rally to his standard, and undertake a serious effort towards solving the perennial problem.

In 1905 and 1906, Blériot, either alone or in collaboration with Gabriel Voisin, built several biplane gliders and flyers which he experimented on the Seine, near Paris.

It was not, however, until 1907 that he was actually to fly; and this was to occur, not on a two surface machine such as he had previously been experimenting with, but on a monoplane, the style of aeroplane from which he was later to derive undying fame.

Leaving the ground for a few feet on April 5, 1907, Blériot improved his record on July 11th, and on September 11th, on September 17, 1907, he attracted universal attention by covering 203 yards in flight, only 38 yards less than Santos-Dumont's record (it must always be borne in mind that the Wright brothers' records were at that time given no credence whatever).

On December 4th and 6th of the same year, Blériot again bettered his record, with a new machine, his flights extending from one to three furlongs, a world's record for monoplanes.

It was not until the following June that this record was broken by M. Esnault-Pelterie, but a few days later Blériot came into his own again, driving his No. VIII *bis* through the air for nearly a mile. From then on he rapidly increased the length of his flights, improving his record July 3, 4 and 6, 1908, the last one extending between eight and nine minutes.

But Blériot, far from satisfied with the results obtained, built yet another machine, which he experimented in the Fall of 1908, in the Beauce country, south of Versailles.

How Blériot steadily bettered his performances last year and finally, on his No. XI made his great cross-country and cross-channel flights is too recent and too familiar a story to repeat in these columns. Suffice it to say that Blériot has proved himself to be one of the greatest among the great men engaged in achieving, step by step, the Conquest of the Air.

ORVILLE WRIGHT

THE FIRST MEN TO FLY:—Whatever may be the opinion held by some as to the effect their present attitude may have on the dawning flying machine industry, or as to the rectitude or justification of this attitude, there is little or no doubt that to Posterity, the brothers whose likenesses appear here will stand out as heroic figures of no mean proportions. To the two men who first succeeded in flying, places are reserved in the Hall of Fame of Human Progress in immediate proximity to such immortal pioneers as Guttenberg, Watt, Fulton, Stevenson, Edison, Bell and some others, and to those who see in mechanical flight not only a step forward but the birth of a new era of incalculable import to Humanity, it must appear that the Wrights will stand head and shoulders above even these men.

Clement Ader, of France, and Sir Hiram S. Maxim, of America and England, succeeded before them in overcoming gravity in man-carrying machines,—the first step in the problem,—but it was reserved to Wilbur and Orville Wright to be the first to make real flights.

It is perhaps because of this tremendous prestige as pioneers that so much is expected of the Wrights in magnanimity and disinterestedness, and there is reason to suppose that their energetic efforts to get what they can out of their invention would be considered entirely natural by their present detractors were they merely looked upon as two average citizens seeking a living from the fruits of their labor, rather than as world's history makers, saddled with a moral obligation of living up to their greatness as such, and, in a spirit of "noblesse oblige," of merely looking upon themselves as stepping stones in the Path of Progress.

These sketches are primarily intended to be biographical in character but, to men interested in aeronautics, the biographies of the Ohioan inventors seem more or less of an old story. The Wrights have themselves told how their attention was first attracted to flying when, as children, they were given by their father a small helicopter as a toy, how they later built such toys themselves and were much surprised to find the difficulties vastly increasing with the size of the models, how they later indulged in kite-flying, and finally in the summer of 1896 took up in earnest the study of the Problem of Flight.

They had built up a small bicycle business in their native city of Dayton, but after they became really interested in aviation, this was neglected for the studies and experiments which were to have such a remarkable result. Their first actual experiments on a large scale took place in October, 1900, when they tried out large gliders as kites. Some months later they entered into relations with Mr. Octave Chanute (who figured among AIRCRAFT'S Big Men of the Movement, in a recent issue), and 1901 saw their first glide in a motorless biplane.

BIG MEN OF THE MOVEMENT

WILBUR WRIGHT

The following winter was spent in an exhaustive study of the laws of air-pressure, and the conclusions reached were confirmed in the gliding experiments of the ensuing year; these glides increased in length until the Fall of 1903, when the brothers were ready to replace the force of gravity as a motor, with a mechanism embodied in the flyer.

A gasolene motor was designed on the general lines of the automobile engines of the time, but when it came to figuring out the shape and size of the propellers the Wrights had once more to revert to investigations of their own.

On the seventeenth day of December, 1903, however, the first Wright motor-driven biplane was placed on the starting-rail and the engines set in motion. When those holding the machine let it go, it started down the track and a few seconds later, as it approached the farther end of the rail that event occurred for which the world had waited such countless centuries: under the combined impulse of its propellers and of the strong wind it was meeting, the machine, carrying its inventor, *rose into the air*, maintaining itself for twelve seconds in the element it was designed to navigate.

Ader had torn himself free of the ground for a longer period than this, thanks to the temporary elasticity of his steam-engine, but with every possible tribute to the great Frenchman (to whom this magazine never fails to give the full share of credit due) no one with any genuine sense of values, would compare the wild uncontrolled leap of the Avion III, on December 12, 1897, to the steady, well-controlled, straightaway flights of the Wright biplane, on December 17, 1903, especially to those which immediately followed the first twelve-second attempt, on that historical day, at Kitty Hawk.

The only feature which places Ader's performance on any plane approaching Wright's is the fact that it was accomplished six years before.

Experiments were resumed by the Wrights in the Spring of 1904, and by November, turns, circles and five minute flights had been made; 1905 saw further trials by the brothers, who, after making some adjustments and improvements to their machine, accomplished several magnificent flights, fully warranting their assertion, made at that time, that they had turned out a practical flying machine.

Owing to their subsequent secrecy and reticence, general doubt was entertained by the vast majority as to the validity of their claims, and it was only when the wonderful biplane was publicly produced in 1908, that it was proved to detractors on both sides of the Atlantic,—and proved beyond the peradventure of a doubt,—that ***two years*** before any other man had flown for ***one half minute***, Wilbur and Orville Wright—of America—had made consecutive flights of ***over twenty miles.***

HENRY FARMAN

HENRY FARMAN, who may well be referred to as the world's most successful aeroplane maker at this date, was born in France some thirty-seven years ago. His father, an Englishman, is the well-known Parisian correspondent of a big London newspaper.

Henry Farman has always been closely and professionally interested in the newer forms of locomotion and his connection with them extends over three distinct periods, in each of which he achieved both fame and prosperity.

When the pneumatic-tired bicycle first appeared some twenty years ago, the Farman brothers, Henry, Maurice and Dick, were among the first to take up the novel pastime and sport.

Henry Farman's first great success in this line occurred in the great Paris-Clermont road-race, where, although little more than a lad, he defeated the most famous professionals of the time—Farman now hopes to win the Michelin Grand Prize by *flying* over the same course—; he then won the 100 kilometres track championship, and later formed, with his brother Maurice—now a rival aeroplane maker—the most famous tandem bicycle team the world has ever known.

When the motor car first made its appearance, Henry Farman was again to the fore; he will be long remembered as a race-driver, if his aeronautical success does not too completely overshadow his performances on terrestrian vehicles.

In the great Paris-Vienna race of 1902, Farman was first in the heavy car class and the next year came very near winning the Gordon Bennett Cup, in Ireland—finishing a close third to Jenatzy and de Knyff.

In the eliminatory race to select the French team for the 1905 Cup race, he missed a turn, the car falling down a ravine, and Farman being kept from following it by the providential presence of a tree, the branches of which caught him as he went by. Farman looks upon his sudden swoop onto this aerial perch as his true debut in aviation.

It was in September, 1907, that Farman first piloted a Voisin off the ground, and since then his success as an aviator and as a constructor have been beyond those of any of his competitors.

As an aeroplane-driver he triumphed, in 1908, in the Deutsch-Archdeacon prize of 50,000 francs, in the Armengaud prize and the height prize of 25 metres. With his own machine he won the Grand Prize at Reims last year, and countless others, while his pupils, Sommer, Cockburn, Paulhan, Van den Born, Efimoff, Frey, Kinet, Crochon, Christiaens, Duray, Rawlinson, Chavèz, Grahame-White, Dickson, Cammermann, Edmond, etc., etc., have captured nearly every prize worth winning in the aviation world, the last being, of course, the famous London to Manchester prize of £10,000, which apparently only his pupils deemed themselves capable of attempting with chances of success.

GLENN H. CURTISS

GLENN H. CURTISS, the man who won for America the first Gordon Bennett Aviation Cup, comes from Hammondsport, N. Y.

When still a boy he acquired local celebrity as a cyclist, and, later, as a motorcyclist,—his greatest success in this line being his famous mile in 26"⅖, the greatest speed at which a human being has ever travelled. Showing great mechanical ability he undertook the construction of motorcycles, and achieved remarkable success in this business; his motors, which were marvels of lightness, became known all over the country and Captain Thomas F. Baldwin, learning of their excellence ordered one for one of his dirigibles.

In 1907, Dr. Alexander Graham Bell, formed the Aerial Experiment Association, the other members of which were Glenn H. Curtiss, F. J. Baldwin, J. A. N. McCurdy and the late Lieutenant T. Selfridge. Throughout 1908 four machines—each one designed by a member of the association—were built in Curtiss's shops at Hammondsport and experimented: the "Red Wing," the "White Wing," the "June Bug" and the "Silver Dart." All were fitted with Curtiss engines.

On May 22, 1908, Glenn H. Curtiss took his place in the seat of this machine and on his first attempt flew 1017 feet, grazing the earth after 615 feet had been covered but keeping aloft for another 402 feet. The time of this first flight was nineteen seconds and Curtiss throughout seemed to be in perfect control of the biplane, which was fitted with triangular wing-tips.

On June 21, 1908, the "June Bug," built after Curtiss's design, was experimented and made three very successful flights; further experiments were made on June 2 and 25, flights of 2,175 feet, in 41 seconds, and of 3,420 feet, in one minute, being accomplished on the latter date.

The Aerial Experiment Association then made application to compete for the "Scientific American" Trophy, for the first flight of a kilometre straightaway, the machine to land without injury.

Further trials were made and, on July 3d, a flight of 1,300 yards in 68"⅘ successfully accomplished, by Glenn Curtiss.

On July 4, 1908, after a trial of 900 yards in 56 seconds Curtiss easily won the prize, flying about two thousand yards in 1 minute, 42 1-2 seconds, the official distance, measured in a straight line, being 5090 feet.

The early successes of Curtiss have been purposely dwelt on here, as being those least known and appreciated.

All the world knows how he won the Gordon Bennett Cup last year at Reims, driving his little biplane at forty-eight miles an hour around the French course, and later won all the more important prizes at Brescia, in Italy. Few, if any, men have done more for aviation, and in particular for American aviation, than America's international champion, Glenn Curtiss.

LAW AND THE AIR

By Denys P. Myers

Continued from May AIRCRAFT

THE CRIMINAL IN THE AIR

IF, as has been stated, the criminal life appeals to its followers largely because of the absence of the prosaic in it, the evildoer ought to come into his own in that regard when he takes to the air. To the bulk of the criminal class extensive use of the sea, either for perpetration of illegal acts or as a means of escape, is precluded. Gambling aboard ship must obey the economic law of the demands of games of chance at sea, and very few evildoers have been financially successful enough to elude their pursuers by taking a water trip in their own craft. Furthermore, only a relatively small number find it worth their while to escape, by going abroad as passengers.

These objections are reduced, from the criminal point of view, in the case of air-craft. From the vantage of the air, firearms and bombs can be used with some purpose on earthly targets, which fact places violent crime at an additional advantage. But especially, the aeroplane or even the balloon is within the financial possibility of a good many of the criminally inclined. Many a criminal might have $5,000 to buy an aeroplane, and by its aid could either avoid or excessively complicate his extradition.

Neat little mystery stories will shortly be written around such circumstances, and as usual the possibilities are greater the more boundaries you introduce. For instance, a perfectly good American—speaking nationally—has a pet enemy, who is an Italian, and both are in France. The American suavely invites the Italian aboard his airship, and takes him up into the air beyond all limits claimed by anybody to be under the control of the subjacent territory. In this stratum of air the American pilots the craft above Swiss territory, knocks off the Italian, who lands in Berne and in the yard of the residence of the Russian minister, a portion of Swiss soil which is acknowledged to be Russian by reason of its diplomatic use. The American continues his aerial voyage, landing in Germany.

That is a first-class mess of crime. Look at it a moment. No known jurisdictional *dicta* apply. There is even a question of whether crime was committed, although a dead Italian is there to show that something out of the ordinary happened. He was undoubtedly dead before striking the ground, but the push given him by his comrade certainly did not kill him. Moreover, the push was administered when the vehicle was beyond the jurisdiction of any state. France really has no interest in punishing the American, for he simply began a perfectly regular aerial trip from her soil; and Germany has no more concern, for he only landed on her territory. He did not enter Swiss jurisdictional boundaries, although the Italian probably expired while passing through her atmosphere. Enter Russia with an interest in preventing the dropping of corpses upon her ex-territorial possessions; Italy desires to protect her citizens from Americans, and has difficulty in realizing that as neither France, Switzerland, Russia nor Germany harbored the perpetrator when the crime was committed, she will have to split hairs some way to establish her right to securing the American for trial. Inasmuch as the latter was out of his country during the whole series of circumstances, the United States can scarcely be appealed to under rigid rules.

Such a series is infinitely more complicated—although it does not exhaust the aerial possibilities—than anything that could occur at sea. Doubtless the legal decision would be somewhat along the lines of *Commonwealth* vs. *Macloon* (101 Mass. 1) where a foreigner to the United States on a foreign vessel belonging to a state different from that of which the defendant foreigner was a liege, injured a man, who died in Massachusetts. The court held that jurisdiction lay where the crime took effect, and Massachusetts proceeded to punish. In the case above, then, Switzerland would prosecute as a plaintiff in error, if, as supposed, the Italian died in midair within its jurisdiction.

Before such a clear-cut decision could be rendered, however, laws would have to determine how much of a drop through air a man is entitled to without being considered legally dead and even if jurisdiction should lie for the consummation of a deed during such a transitory and casual passage.

These are fundamentals, and although it does not touch the former, Fauchille's code deals well with crime in the air in his Art. 15, which says:

Crimes and misdemeanors committed aboard aerostats (or aeroplanes) wherever they may be in space, by members of the crew or other persons aboard, are within the competence of the tribunals of the nation to which the aerostat (or aeroplane) belongs and are judged according to the laws of that nation, whatever be the nationality of the authors or victims.

"This would secure unity of procedure at the expense of justice," comments Judge Simeon E. Baldwin. Arthur K. Kuhn adds that the principle adduced is likewise against the basis of Anglo-American law, which is territoriality. While these glosses are correct, it would seem that probably an international agreement will compromise in the direction of this statement of the case.

One of the earliest brochures on legal relations in the air was one by Dr. Gruenwald, military counsel of the first German guard division. He concludes:

"Only so far as the interest of the territorial state extends is it justified in the exercise of jurisdiction over crimes committed in its property-sphere."

With characteristic German thoroughness he scientifically views the subject from every standpoint. He finds that culpable actions may be committed over the high sea or state-free land districts, when the perpetrator is in a state or a private airship, and with or without right of nationality in his home state; and, culpable actions may be committed over states, their property or coastal waters, in a public or private airship, where the deed is limited in influence to the immediate vicinity of the airship, where the deed affects the sphere of interest of the territorial state and where it is committed on one airship and affects another airship or its occupants.

A little thought will show that in the majority of these instances it would naturally be the state to which the aircraft owes allegiance that would claim jurisdiction, and that otherwise the proper interest of the territorial state in protecting its own sovereignty would give rights in a specific case. So, if we consider the paragraph from the Fauchille code merely as the enunciation of a general principle, it can easily be defended.

One point that will probably arise frequently involves the situation in which the late Hubert Le Blon found himself at Doncaster, on October 25, 1909, some months before his death. A strong and erratic wind was blowing, but the starting park was so enclosed that he mounted into the air on his Blériot monoplane, in a virtual calm. No sooner was he up, however, than he struck the strong currents prevailing. He drove his machine into the teeth of the wind, which turned him toward the large crowd assembled. He accelerated his engine, raised his elevator, cleared the crowd at a height of barely twenty-five feet and, dropped like a stone beyond it, smashing the chassis.

Here was a case where homicide or personal injury might have been inflicted upon a bystander in the crucial five seconds the manœuvre required while the aviator was attempting to save himself. The legal maxim says *sic utere tuo, ut alienum non laedas*

(You shall use your own in such a manner as not to injure another), which would indicate that Le Blon was well advised by his own genius in avoiding the crowd. It has been judicially determined that one cannot intentionally take another's life to save his own (*Regina* vs. *Dudley*, L. R., 14 Q.B.D. 273), but if in taking the voyage a man is doing a lawful act, the law of self-preservation would speak in his favor in such a hazard (*Morris* vs. *Platt*, 32 Conn. 75).

There is no dissenting voice to the proposition that infractions of law affecting the safety or fortune of a state, such as conspiracy, treason, counterfeiting, etc., shall be judged by the tribunals and under the laws of the injured state, if such deeds are committed in any part of the air-space.

In fact, the general principle of the right to preserve its own interests and institutions from injury or threatened injury from the air will probably be the chief guide-post in setting up a code of law for aerial machines.

Another interesting case suggests itself. Suppose a crime or misdemeanor has been committed upon a craft, which then lands upon the soil of a state not otherwise concerned. If the deed is within the ordinary or treaty competence of the state, it will likely be determined that it should proceed to try and punish, especially in European countries. If the act is beyond the state's competence, then it should proceed with the arrest of the alleged culprit and take the necessary measures, subject to instructions.

These things refer to private air-craft only. Public air-craft will, of course, be as free as public sea-going vessels, and local authorities in such cases ought to interfere only upon the written request of the official in charge of the machine.

One thing is certain: Law will be applied to aerial situations about as quickly as criminals enter the field.

To be continued in July AIRCRAFT

HOW TO BUILD A GLIDER

By W. H. Phipps

A SIMPLE glider of the biplane type can easily be constructed at home or in a small workshop; the cost of materials is not great and the construction does not necessitate the hiring of workmen.

MATERIALS.

In selecting materials care must be taken to see that the wood is free from knots, and straight-grained. The wood used throughout should be spruce, from which strips should be prepared as follows:

Eight long main spars ⅝ inch thick, 1¼ inches wide and 10 feet long; these spars are to be joined together by the method shown in Fig. 5;

Twelve crosspieces ½ inch thick, ½ inch wide and 3 feet long;

Twelve uprights ¾ inch thick, 1¼ inches wide and 4 feet long;

Forty-two strips for the curved ribs, ¼ inch thick, ½ inch wide and 4 feet long;

Two arm-sticks 1½ inches thick, 2 inches wide and 3 feet long;

Two rudder-sticks ¾ inch by ¾ inch and 9 feet long;

In making the tail, ½-inch-square sticks should be used for the frame and the ribs spaced 1 foot apart, as shown in Fig. 1.

CONSTRUCTION.

The framework of the main planes should be put together first by bolting the cross struts marked C in Fig. 2 to the under sides of the main spars marked M in Fig. 2, being careful to space them apart as shown.

The bolts to be used throughout the construction of the glider are three-sixteenths-inch stove bolts, fitted with washers.

These main planes should now be braced with No. 16 piano wire, the joint used being that shown in Fig. 4, for which about 7 feet of copper tube will be needed, when cut up into ½-inch pieces.

The ribs may now be nailed to the main spars by using 1-inch brads; the joints thus formed should be wrapped securely with shoemaker's thread. The ribs are to be spaced 1 foot apart; they must all extend 1 foot beyond the rear spars of the main frames; they should be steamed and bent to the curve shown in Fig. 3.

The covering for the planes should be bleached muslin or some light aeronautical cloth; it should be tacked to the rear edges of the ribs and sewn around a wire stretched along this edge. After carefully fastening the cloth to the rear edge, stretch it tightly over the ribs, leaving an opening 2 feet by 4, in the centre, as shown in Fig. 2.

The main planes may now be joined together by inserting the twelve uprights (see U, Fig. 1 and Fig. 3); the uprights are fastened to the main spars by using small iron right-angle joints and bolts, as shown in Fig. 4. The entire frame should be braced with piano wire, using the fastening shown in Fig. 4. The cross tail should be made according to the dimensions given in Figs. 1, 2 and 3. This tail should be covered with the same stuff as that used on the main planes; the whole should be braced with piano wire, as shown.

The tail is fastened to the frame by the tail-sticks, marked TS in Fig. 3; it is braced by diagonal wires and also by guy wires leading to the main planes, as shown in Fig. 2.

The two arm-sticks AA (Fig. 2) should be spaced 14 inches apart and the edges must be rounded off where they fit under the arms.

The glider should now be carefully examined and tested for strength: this can be done by placing the two ends on boxes, the operator then suspending his weight in the centre: the glider should not bend under this strain.

GLIDING.

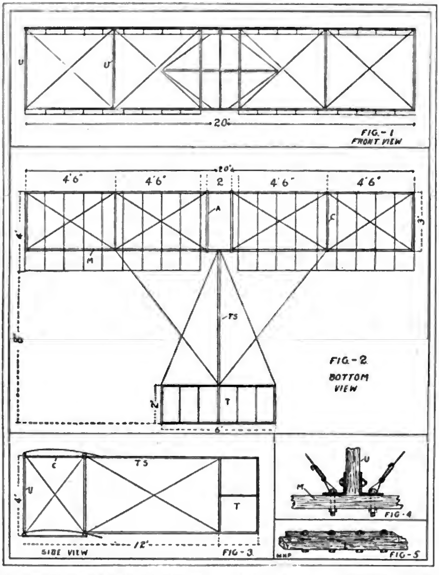
To perform a glide take the glider to the top of a mound, get into the centre of it, lift the machine up, put the arms over the arm-sticks and grasp the front; then face the wind, run a few steps against it, and jump from the ground.

The glider will glide down the hill, if the weight of the operator is kept in the right place; the exact position of the operator in the machine will vary with his weight, and the only way to get the best gliding flights is to practice daily, if possible, beginning with short glides and gradually increasing them in length as the operator gains skill.

The proper position of the operator is slightly ahead of the centre of the planes, but this will vary with different weights and must be ascertained by experience.

Glides should not be attempted in winds blowing over twelve to fifteen miles an hour. Even in light winds balancing will be found quite a task; only the quick shifting of the legs can restore the balance.

The beginner should practice continuously.



THE WRIGHT AND SELDEN PATENTS—A COMPARISON

By Hugo C. Gibson

Technical Expert for the A. L. A. M. in the Selden Suit.

THE situation brought about by the sustention of the Wright patent is an illustration of the repetition of history in this country of big commercial patent suits. It is not so long ago that automobile interests were in the throes of active legal conflict, in which the chief ammunition of the defense was such suggestions as "Throttling the Industry," "Trust," etc., and perhaps the most persuasive argument of the prosecution was the threat to attack individual owners of machines on which a license had not been secured, and was addressed to the purchaser, against whom it was used as a direct intimidation.

The effect of this was to cause the unlicensed manufacturers to assume all responsibility of legal suits brought against each purchaser of their machines, and consequently the makers who had enough sand to build their houses with were rewarded by the confidence of the public and a remarkable flood of orders.

It is interesting to note that each individual, if he be the first to fight a monopoly, is also the first when he conceives an idea to rush to the patent office with a demand for the grant of a monopoly.—Human Nature.

These unlicensed users of machines were then, merely supporting the fight against the monopoly, on principle, and not because it cost more for a licensed car. The licensed makers offered cars just as low in cost as the unlicensed.

In the early days of the Association of Licensed Automobile Manufacturers, known as the "A. L. A. M.," somewhat heavy demands were made of each prospective member, entailing as a result the direct antagonism which eventually caused hundreds of thousands of dollars to be spent on a useless lawsuit—useless because of the obviously valid nature of the patent. Neither is the world one whit the better off (nor is the inventor), whereas much money and time could have been saved by a moderate attitude, and the art in that case would certainly not have stood still, for natural competitive incentive would always prevent stagnation.

The outcome of the suit was that when the courts could not in equity see any substantiation of the accusation of the defense; "Trust," by reason of the *then* extremely lenient demands of the plaintiffs, the verdict was given in favor of the validity of the patent. Contrast this with the results of the mental attitude inculcated by a hoggish demeanor of the patent holders. Is it reasonable to suppose that any court would give a patentee much satisfaction if it were shown that he had a basic patent, kept same in the dark, and eventually swooped down upon infringers with exorbitant demands after holding it aloof while the trade built up? No. Equity dictates a reasonable reward to the inventor and reasonable treatment of the manufacturer desiring to work under the patent; generally known as "Infringer."

The Wright patent situation must be solved by the imposition of a reasonable license fee indiscriminately upon all machines involving the subject, that are used for gain or are sold.

Inasmuch as the Wright Company seems to see more profit in the "Show," or "Aerial Acrobat," end of things at the present time, it is likely that they would require a considerable proportion of any gains made by an infringing machine, and, while justly entitled to these rewards, they should ease the way for the inventor and investor.

The art as a commercial success will be made, not by the Wright Company, who, as they stand to-day, are restrictive, but by the masses of inventors and investors.

The general solution to be recommended is:

To the Wright Company:

To allow everyone to develop the art, and in doing so to develop popular enthusiasm, which means demand. To this end impose a very low license fee on all machines obviously infringing the disclosures of the patent. This will encourage inventors of details to enter the manufacturing end in a commercial way.

To the Public:

If you are *sure* that your machine does not infringe, go ahead. However, most machines *do* infringe under the present rulings, so get busy with men with sand, grit and money, and do as Henry Ford did in the Selden suit—make money, have public sympathy with you, and, as in that famous suit, compel the Wright Company to be reasonable.

They have to be reasonable if they wish to retain decisions in their favor, for equity and popular opinion count in the mental construing of the question: What is the mechanical equivalent of a warping wing?

RECORDS AND STATISTICS

WE wish to thank all those who have written concerning our "Records and Statistics."

Several foreign publications have printed lists similar to ours in the last few weeks, but, with the exception of that of the "Revue de l'Aviation," of Paris, it must be said that they were not compiled with sufficient care to insure accuracy.

With a view of reaching some definite International agreement on the validity and respective merit of these historical "past performances," we have written a letter to the "Revue de l'Aviation" concerning the slight discrepancies in our respective lists and data, and concerning the unreliability of some lists recently published.

We annex a translation of parts of this letter which will go far towards answering the many inquiries received as to why certain performances were omitted from our pages and others included:

"Dear Sir:—In a short time an hour-flight will be such an ordinary occurrence that it will be difficult to establish an absolutely accurate list; it will be necessary to confine oneself to two-hour flights.

"This difficulty already exists to a certain degree, and our two lists do not exactly coincide.

"In your list H. Farman, Sommer and Paulhan occupy the fifth, sixth and seventh position, respectively. It seems to me that you forget the fine flight made by Paulhan at Douai (1 hr. 7 min. 19 sec., July 15th), in which he got within 18 seconds of Latham's French record. It is with this flight in mind that I placed him fifth, with Farman sixth (1 hr. 23 min., July 19th), and Sommer seventh (1 hr. 5 min. 30 sec., July 22d).

"As regards Sommer, however, I think that we are both in error, for did he not make a flight of 64 minutes on July 18th? He is thus the sixth to accomplish an hour-flight.

"You place Bunau-Varilla ninth; but has he ever really made a continuous flight of one hour?

"In the last hours of the unforgettable Rheims week he held the air two hours, winning the 'Mecaniciens' Prize,' but it was *not* in continuous flight, and I have been often assured that none of his individual flights reached the hour-mark. I would be glad to hear from you on this point.

"Hans Grade is in sixteenth place on your list. I know of a fine flight of his of 54 to 55 minutes, early last winter, but I never heard of his flying a full hour. The place he has in your list (between de Lesseps and Mortimer Singer) would indicate that the performance qualifying him to it was accomplished between December 16th and 21st.

"The German publications gave an account of his 54-minute flight under the head 'Grade Flies for an Hour,' but the account itself showed that the duration of the flight lacked several minutes of an hour.

"You place Château between Mortimer-Singer and Delagrange (December 21st and December 30th); was not Château's flight of 61 min., 15 sec. made on December 12th? Furthermore, do you not omit the hour-flight of Jacques Balsan on December 29th?

"Both you and I give nineteen aviators as having flown for an hour, prior to the present year; I do not include Bunau-Varilla and Grade, but I include Balsan and Lieutenant Humphreys. The latter is the second American pupil of Wilbur Wright; on November 3d he flew 1 hr. 1 min. 20 sec., with Lieutenant Foulois as a passenger (the latter was in control at times through the supplementary levers).

"The first pupil, Lieutenant Lahm, just missed the hour mark by a minute and a half, at about the same time, last year.

"As regards 1910, our lists coincide except on two points—I place Van den Born before Olieslargers (because of his 76-minute flight on January 5th), and I include Curtiss (who flew 1 hr. 25 min. 5 sec., at Los Angeles—the first time this speedy type of biplane has flown an hour).

"A later list which appeared in a Parisian newspaper seems to contain many errors.

"Thus the flights of Rougier and of Calderara, at Brescia (September 12th), and of Paulhan, at Tournai (September 13th), were not continuous flights at all.

"Furthermore, Rolls is credited with a 64-minute flight on December 31st, whereas the English papers agree that this flight lasted 55 minutes.

"Captain Marconnet is also credited with an hour flight on April 6th; he was referred to, however, as a passenger on this flight, at the time it occurred.

"There are also some discrepancies between this list and the accounts published, at the time, of the Johannisthal meet and the final flights of the year at Mourmelon, when trying for the Michelin Cup."

The latest men to make continuous flights of an hour (see the May AIRCRAFT) are:

35. Edmond	1 hr. 02'	March 29, 1910
36. D. Kinet	1 hr. 02' 30"	April 2, "
37. Gibbs	1 hr. 12' 45"	" 1, "
38. Christiaens	1 hr. 02' 58" 2-5	" 3, "
39. Dubonnet	1 hr.	" 1, "
40. Capt. Dickson	1 hr. 33'	" 5, "
41. Jeannin	2 hrs. 01'	" 11, "
42. Leblanc	1 hr. 15'	" 11, "
43. Legagneux	1 hr. 30'	" 20, "
44. Rolls	1 hr. 04' 02"	" 21, "
45. Péquant	1 hr. 07'	" 21, "
46. Bouvier	1 hr.	" 28, "
47. Kœchlin	1 hr. 10'	" 29, "

Edmond's official time on March 29th was 59 min. 32 sec., but it appears that he only passed the starting point 2 min. 30 sec. after leaving the ground; Kinet's flight was made with a passenger; the total duration of Dubonnet's cross-country flight of April 3d was 1 hr. 48 min. 54⅘ sec., but he alighted for a few minutes to inquire his way, an hour after starting.

On April 8th Kinet beat the world's record for a two-man flight. In view of this, and the particular interest such flights offer from a military standpoint, we publish herewith a table showing the progression of the world's record in this line.

PROGRESSION OF WORLD'S RECORD

For "Two-Man" Flights in Heavier-than-air Machines

Date	Time	Aviator	Passenger	Machine	Motor	Place
March 22, 1908	A second or two	Léon Delagrange	Henry Farman	Voisin	Antoinette	Issy-les-Moulineaux, near Paris
April 30, "	" "	Henry Farman	Gabriel Voisin	"	"	" " "
May 8, "	A few seconds	" "	Mr. Farman, Sr.	"	"	" " "
" 14, "	29"	Wilbur Wright	C. W. Furness	Wright	Wright	Near Kitty Hawk, N. C., U. S. A.
" 14, "	1' 40"	"	"	"	"	" "
September 9, "	6' 26"	Orville Wright	Lieutenant Lahm	"	"	Fort Myer, Va., U. S. A.
" 12, "	9' 06" 1-5	"	Major Squier	"	"	" "
" 28, "	11' 35" 2-5	Wilbur Wright	P. Tissandier	"	"	Near Le Mans, France.
October 3, "	55' 37" 3-5	"	F. Reichel	"	"	" " "
" 6, "	1 hr 04' 26" 1-5	"	A. Fordyce	"	"	" " "
" 10, "	1 hr 09' 45" 3-5	"	M. Painlevé	"	"	" " "
July 27, 1909	1 hr 12' 40"	Orville Wright	Lieutenant Lahm	"	"	Fort Myer, Va., U. S. A.
September 18, "	1 hr 35' 47"	"	Captain Engelhard	"	"	Near Pottsdam, Germany
January 31, 1910	1 hr 48' 50"	C. Van den Born		Farman	Gnôme	Mourmelon, France
April 8, "	2 hrs 19' 15" 2-5	Daniel Kinet	M. Lebedeff	"	"	" "

Foreign News

By Albert C. Triaca

PAULHAN ARRIVING AT MANCHESTER.

Argentine Republic

Among the many flights made by Bregi recently, on his Voisin, at Buenos Ayres, must be mentioned that of April 18th, when he flew the 19 miles separating the Villa Longchamp from Lugano, soaring over the city and suburbs, thus winning the Lonsquit prize; he attained an altitude of 1,000 to 1,300 feet. Aubrun flew over Estancias on his Blériot, while Valeton made a flight with a passenger, on his Henry Farman.

Another meet, with $35,000 in prizes, is projected.

Austria

The first Austrian airship construction company has just been formed with a capital of 300,000 kronen; it is understood that the War Office is immediately placing an order for a dirigible. The constitution of the company is largely due to the fact that the efforts of the Government to obtain a dirigible from Germany during the recent crisis failed.

Early in April, Hieronimus had quite a bad fall with his Blériot, when flying near Vienna. He was, however, but little hurt.

Belgium

A monoplane has been built at Liege by M. Moulins; it is of the Antoinette type.

Several new prizes have recently been offered in Belgium; the Brichart prizes, a challenge cup worth 2,700 francs and three cash prizes of 2,500, 2,500 and 2,300 francs go to the aviators "lifting" the greatest "useful weight," i. e., pilot, passengers, fuel, lubricant; the Haardt and Devos distance prize is a $400 cup; the Altenlot height prize is a $100 cup.

Much interest is being shown in Belgium in the splendid showing being made abroad by Belgian aviators; Van den Born, Olieslaegers, Kinet, Gaudart, Christiaens, Tyck, Duray, Bn. P. de Caters are certainly names to be reckoned with.

Brazil

Mr. Bergeron, who has been taking lessons from the Comte de la Vaulx in piloting a Zodiac dirigible, is about to come to Brazil with a small demountable airship of this type.

Rio de Janeiro will see its first aeroplane flights within a few weeks; a promising machine is now nearing completion there.

Canada

The last flights made over the ice, in Nova Scotia, in April, occurred just too late to figure in the May AIRCRAFT.

The Canadian Aerodrome Company have here turned out a most promising monoplane, which was driven in several successful flights by the owner, Mr. Gardiner Hubbard, of Boston.

Like in Messrs. McCurdy and Baldwin's successful biplane, the Baddeck II, the motor used is a six-cylinder Kirkham.

China

It is said that at the Nanking International Exposition, which opened on May 10th, and will be kept open until December, one of the features will be an aviation meet. We have not heard, however, of any real flying in China so far. It is probable that when the Chinese take up the game, however, it will not be long before they become master-aviators, for their centuries of familiarity with the science of kite-flying will no doubt hold them in good stead when it comes to replacing the string with a motor (which is, of course, the main distinction between an aeroplane and a kite).

The news that a number of Chinese soldiers have put their names down for a course at the Friedrichshafen College of Aeronautics in Germany, is only the result of the deep interest shown by their Government in all things relating to the Conquest of the Air. The new Traffic Minister, Hsu-Shi-Chung, is an ardent admirer of Zeppelin, and it is due to his unremitting endeavors that Prince Tsa, head of the General Staff, attended by a commission of officers, is paying a visit to Europe to investigate the condition of aeronautics in the different countries, and order several such dirigibles as are best suited to the purpose of the Chinese. An enquiry has also been instituted by every province in the huge empire to find persons who by profession or study are interested in and have a grounding of aeronautics. The names will be collected by the Traffic Department for further reference. Professor Chatley at Tong Shan ought to be useful to this new enterprise.

Cochin China

The first aeroplane to reach this colony is the Blériot of the "Cross-Channel" type, recently purchased by the Saigon section of the French Aerial League. Mr. Affolito will pilot the monoplane.

Cuba

The French aviator Bellot is due at the end of May at Havana on the liner "Le Champagne;" he is said to have a three months' contract to fly in the island.

Dutch East Indies

Henrik Broudgeest, of Holland, arrived at Batavia with his Gnome-driven Farman biplane some weeks ago and is about to undertake some flights. Both colonists and natives are looking forward with impatience to witnessing the first flights over Javan soil.

Egypt

Jacques Balsan, who, it will be remembered, was hurt during the Heliopolis meet, spent his convalescence on the Upper Nile; he has now left, entirely recovered from the effects of his fall in his swift Blériot.

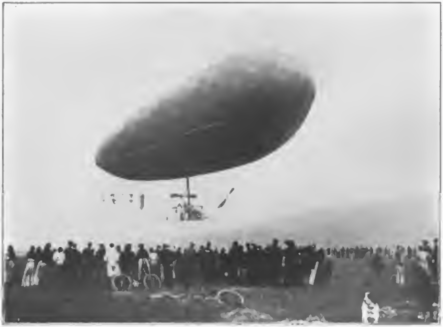
England

LONDON-MANCHESTER.

Both the successful and unsuccessful attempts made to win the "Daily Mail's" $50,000 prize, for a flight (to be made in twenty-four hours, with two stops allowed) from within five miles of their London headquarters, to within a similar distance of their Manchester offices, have received such deservedly universal notice from practically every newspaper in the two hemispheres that there is little which we can add to emphasize the nature, merit and significance of the performances accomplished.

To Paulhan, the invincible virtuoso, and to Grahame-White, the plucky and remarkably proficient newcomer, equal praise is due.

That twelve hours and one stop sufficed the former instead of the twenty-four hours and two stops allowed him, shows pretty clearly that his performance was no fluke; darkness, cold and wind contributed their share to the difficulties



THE BIG FRENCH DIRIGIBLE "CLÉMENT-BAYARD II." INTENDED ORIGINALLY FOR ENGLAND, BUT BOUGHT BY THE FRENCH GOVERNMENT.

to be overcome, but these could not stop the little Frenchman, who landed in the allotted field, near Manchester, at 5:32, in the morning (April 28th), to the delirious enthusiasm of the many thousands who had arisen at that hour to greet him.

In the same way that Bleriot literally caught Latham napping on that fateful July 25th of last year, on the French side of the Channel, Grahame-White—who could not believe Paulhan could get his machine put together and be off in it, within eleven hours—was asleep when Paulhan started for Manchester; it cannot be said that this lost him the prize, however, for he did not succeed in reaching Manchester in the allotted twenty-four hours.

With a little more experience Grahame-White could also have successfully battled against the gusts of the following wind, in the early morning, in which case he and Paulhan would have raced to the goal in actual sight of each other (for White came down at four o'clock within ten miles of Paulhan's stopping place, which the Frenchman only left at ten minutes past four).

Grahame-White's great attempt of the previous Sunday (April 24th), when he flew for over two hours at a single stretch, shows what such machines as the Henry Farman, fitted with Gnôme engines, can accomplish in the hands of virtual beginners.

The $50,000 were presented to Paulhan in a gold casket, at the banquet given on April 30th, his unsuccessful and generous rival receiving a handsome silver cup—a well-deserved tribute to his grit and sportsmanship.

The monument commemorating the landing of Bleriot at Dover was inaugurated on April 8th, in the presence of Blériot. A picture of this appropriate memorial occurred in the April number of AIRCRAFT.

Grace made a great flight in Kent recently, during which he soared over the British battleships in the harbor. He had his Short-Wright under fine control and was up fifty minutes.

To C. H. Parkes, of Monmouth, Wales, belongs the distinction of constructing the first aeroplane yet built in Wales. The machine, like so many others of British make, takes after the "Channel Crossing" Bleriot type.

France

The "Clément-Bayard II" is, after all, to belong to France! The Government has, at the last minute, stepped in and undertaken to purchase itself, the big dirigible, which it had been understood, was destined for England.

Mr. Clément asserts, however, that he will first make his long-planned trip to London.

Trials have already been made, but a slight accident to the rudder has delayed their completion a week or ten days.

On May 3d the War Department announced that there would be ready for participation in the summer manœuvres a semi-rigid dirigible, which had been constructed under its direction and with strict secrecy.

Although being but of 3,000 cubic metres capacity, "La Frégate," as this dirigible will be called, will, it is claimed, carry two cars, containing motors giving 240 h. p. A speed of 50 miles an hour is mentioned as likely; France is evidently waking up to her deficiency in aerial warships.

THE HUMBER MONOPLANE: A RACING FLYER, DESIGNED BY THE LATE LÉON DELAGRANGE AND HUBERT LE BLON.

The cyclone which swept over the Chalons plains on April 15th was not as serious in its consequences as was at first thought; the plant of Henry Farman at Mourmelon was destroyed and several of his biplanes badly damaged, but little harm was done to the aviation-colony outside of this.

The military dirigible hangar, however, was blown down and two workmen killed by the falling wreckage.

The name of Tellier has long been associated with sterling motorboat construction, and the engine which has carried these craft to victory on so many occasions has always been one furnished by the veteran automobile firm of Panhard-Levassor.

That this same combination should do well in the production of air-craft might well have been expected, but that they should achieve at their very first attempt a performance so remarkable as that accomplished by the young French sportsman, Emile Dubonnet, on April 3, is worthy of more than passing comment and commendation.

ROGER SOMMER AND HÉLÈNE DUTRIEU ON A SOMMER BIPLANE.

MLLE. DUTRIEU HAS SINCE DRIVEN A SOMMER IN FLIGHT FOR FIFTEEN MINUTES, AND FLOWN WITH A PASSENGER.

A great many accounts have been published of this great cross-country flight of the bran-new Tellier monoplane, which occurred as our last month's issue was about to go to press. The actual distance was 68½ miles, from Juvisy, just south of Paris, to the village of La Ferte St. Aubin, some miles south of Orleans; the official time: 1 hr. 40 min. 54⅕ sec.

It is not correct to say, however, that this flight was made without a stop. As apparently often happens in cross-country flights, Dubonnet lost his way after flying for about an hour, and flopped down into a field, near some startled peasants, to enquire his way of them. He never stopped the motor, however—merely throttled it down—and was off again in less than a minute, almost before the amazed rustics had realized what had happened. This flight won for Dubonnet the 10,000 francs of the Prix de "La Nature," for a straightaway flight exceeding 100 kilometers in length.

It also stood as a world's record for cross-country flying until April 28th, when Paulhan made his amazing raid from Orleans to Arcis-sur-Aube, in his Henry Farman biplane.

On April 27th Henry Farman himself had flown with a passenger (M. Robert Candrillière) from his aerodrome near Etampes to Orleans, a distance of between 30 and 40 miles—which is still the world's cross-country record for a "two-man" flight. Paulhan mounted this same machine next day, took flight, and only landed at Arcis-sur-Aube. The distance covered by Paulhan in this uninterrupted flight amounted to fully 130 miles, which is equivalent to the distance separating Governor's Island, in New York Bay, from the ocean-side of Block Island in the Atlantic, or from Pittsfield, Mass.! Paulhan took somewhat over three hours to wing his way over that tremendous stretch of territory. His flight, therefore, not only took him further and lasted longer than any straightaway flight yet made, but is also the longest he has ever made under any conditions, and the third longest ever made by anyone in the history of aviation, the first two standing to the credit, of course, of his friend and teacher, Henry Farman.

Not satisfied with this historical achievement, Paulhan left the ground next day at the spot where he had landed and drove the Farman, propelled by its tireless Gnôme engine, to the old headquarters of Henry Farman, on the Chalons plains.

The three-day tour thus covered 220 miles, with only two stops between start and finish; it is little wonder that the expression "aerial touring" was used for the first time in connection with it by the enthusiastic French reporters.

On April 2d, at Pau, Bleriot, on his new monoplane, built to withstand a powerful engine and fitted with a Gnôme motor, made a flight of one hour and a quarter. This exceeds his previous longest flight (that of October 10th, at Frankfort) by just one minute.

Another record went by the board on April 4th when Roger Sommer made a circular cross-country flight lasting 65 minutes.

In passenger-carrying the month has also furnished many remarkable performances, notably that of Daniel Kinet, who on April 8th, smashed the world's record for a "two-man flight," remaining in the air with a passenger 2 hrs. 10 min. 15⅗ sec. A tabular history of the "two-man" record appears on page 144.

Another fine flight with a passenger was made on April 6, by Lieutenant Camermann, on his military Farman. It lasted 1 hr. 10 min. Captain Mareonnet, another army officer, was the passenger.

Perhaps after all the most remarkable performance in passenger-carrying, however, was that of Roger Sommer, who, on April 20th, at Mouzon, carried up three passengers. Although they did not average the regulation weight of 60 kilogs. (132¼ lbs.), the amount of fuel taken up counterbalanced this, as will be seen from the following analysis:

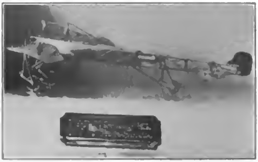
Roger Sommer	132 lbs.
Hélène Dutrieu	100 "
M. Colombo	132 "
M. Frey	128 "
Gasoline	44 "
Total	532 lbs.

The flight lasted several minutes.

Sommer has now opened a sub-school at Mourmelon; it was recently inaugurated by Legagneux, who is an expert handler of the little biplane. Sommer biplanes will, by the way, make their first public appearance at the coming Lyons meet, as will also the Tellier monoplane.

The leading particulars of the Sommer biplane are: Span, 34 feet, chord, 6 feet 8 inches; camber, 4 inches; gap, 6 feet; skid track, 9 feet; areas main planes, 456 square feet; tail, 69½ sq. ft.; elevator, 45 sq. ft.; rudder, 9 sq. ft.

We publish both pictures and drawings of the Sommer machine, and also of the new type of Voisin biplane; in the latter the presence of ailerons (a pair on each side, very long and narrow, placed between the wings) shows a most radical departure from all previous Voisin machines, which relied solely on their construction for lateral stability natural and automatic. The span of the main planes is 29½ feet, as is also the overall length.



MONOPLANE MODEL IN SOLID GOLD, PRESENTED TO THE PRINCESS OF WALES, NOW QUEEN OF ENGLAND.

Rougier, the Voisins' crack driver, flew on the new machine for the first time on April 12th; it is claimed to be very fast—60 miles an hour, if some reports are to be believed. Rougier, however, used his old Voisin at Nice; it was of course reduced to matchwood when hauled out of the Mediterranean, after his fall of April 18th.

The latest aviator to take pupils is Maurice Farman; the Marquis Ugolino Vivaldi Pasqua took his first lessons on the swift biplane the other day.

Jacques de Lesseps wishes to fly from Calais to Dover and back without alighting. he will enter for the Ruinart prize of Fcs. 12,500, which Blériot failed to win, when he crossed the Channel, through not complying with the entry rules.

The aeroplane of Nieuport caught fire on April 18th while in flight, he was, however, able to land safely and quickly put out the conflagration.

On this same day, April 18th, nine Henry Farman biplanes were out, at Mourmelon. When one thinks of all the other machines of this make which have been winning prizes in Europe recently, it is apparent what a thriving industry that of aviation is already for the larger firms.

THE KING OF SWEDEN AND HIS FAMILY GETTING POINTERS ON AVIATION, FROM ROUGIER, AT NICE.

On April 23d, Emile Dubonnet duplicated Comte de Lambert's feat of flying over Paris. He steered his Tellier monoplane with great daring and unerring skill over the maze of roofs and chimney pots, and flew up the Champs Elysées, barely above the treetops, to the amazement of boulevardiers and populace. He landed at Bagatelle (at the very spot where Santos-Dumont's first flights were made four years ago).

It seems churlish to voice any criticism of such an exploit; it is nevertheless to be hoped for the general advancement of the Art that no further over-town flights will be taken for the present, at too low a height for a safe landing place to be picked out to glide to in case of motor trouble.

Dubonnet has an excellent motor, but it is unpleasant to contemplate what a stopping of it would have meant at this time, and the fact that it is especially the "man below" whom it would endanger, rather than the aviator, should make flying-men particularly chary of indulging in these flights.

A few days later he flew before President Roosevelt, at Issy-les-Moulineaux. A strong wind was blowing, but he insisted on flying nevertheless; his machine was somewhat damaged on alighting.

Among the latest passengers taken up by the Comte de Lambert were Miss Ethel Roosevelt and Kermit Roosevelt. They much enjoyed the trip in the Wright.

Bréguet, who, it was feared, was badly injured in his fall of the 18th of April, is on the high road to recovery.

Parisians are promised a permanent aerodrome at the doors of the French capital; Comte d'Aubigny is the instigator of the movement, and the site chosen is near the village of le Bourget, some three miles from the northeastern limits of Paris; the course is to be five kilometres in circuit.

RESULTS OF THE CANNES MEET.

Grand Prize of the City of Cannes. (Totalized duration, during meet.)

1	Christiaens (Farman, Gnôme)	5 hrs. 45' 30"
2	Crochon (Farman, Gnôme)	4 hrs. 50' 8" 3-5
3	Frey (Farman, Gnôme)	3 hrs. 57' 45"
4	Edmond (Farman, Renault)	3 hrs. 06' 46" 4-5
5	Popoff (Wright, Wright)	1 hr. 20' 02" 1-5
6	Molon (Blériot, Anzani)	1 hr. 05' 48"
7	Baratoux (Wright, Wright)	53' 49"
8	De Riemsdyk (Curtiss, Curtiss)	18' 16" 2-5
9	Sands (Antoinette, Antoinette)	20' 02" 2 5

Longest Continuous Flight

1	Crochon	1 hr. 9' 29"
2	Frey	1 hr. 9' 02" 2-5
3	Christiaens	53' 06" 2-5

Lap Prize

1 Baratoux, 3 De Riemsdyk,
2 Christiaens, 4 Crochon,
5 Edmond.

Regularity Prize

1	Crochon	1 hr. 9' 29"
2	Frey	1 hr. 9' 02" 2-5
3	Edmond	32' 33"
4	Crochon	53' 17" 3-5
5	Frey	38' 04" 2 5
6	Crochon	35' 58" 1-5
7	Christiaens	35' 47" 3 5

Starting at Given Time

1 De Riemsdyk, 3 Christiaens
2 Crochon, 4 Molon,
5 Edmond

Speed Prize

1 Edmond, 3 Popoff,
2 Christiaens, 4 Baratoux.

Height Prize

1 Prince Popoff, 680 feet.

THE NICE MEET.

The Nice meet was a triumph in every way, and any previous display of competitive flying appears tame in comparison with the results obtained there. "Everyone was flying all the time," would aptly describe the impression of the onlookers; it was not unusual to see, not merely half a dozen aeroplanes aloft, but six different types of machines whirring through the air.

Efimoff, Chavez and Farman covered many hundreds of miles in flight during the week; they would only come down to replenish their empty tanks and start off again, adding lap after lap, mile after mile, to increase their "totalization."

Latham indulged in high flying, and when the other machines were crowding each other in the lower reaches he would be soaring eaglelike far above.

Olieslaegers showed what can be done with a Blériot monoplane when in the hands of a true man-bird, whilst Grade did both himself and his racy little monoplane credit, until his unfortunate "landing" in the River Var.

The meet was held at La Californie, a few miles east of Nice, on the seashore. All the flyers made trips out to sea, a great many of them flying for miles over the Mediterranean, in all directions. Rougier, de Riemsdyk and Latham were the ones who got duckings, but they were all promptly fished out, and when the number of miles travelled over the water by all the aviators is considered, it is remarkable that not more were forced to come down when away from land.

Van den Born was the first to carry a passenger out to sea; later he flew all the way to Monte Carlo and back.

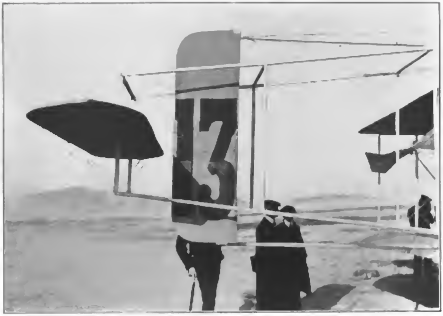
The "cruises" on the last two days—flying to Cap Ferrat and to Antibes—were most spectacular.

FRENCH BOOKS.

The latest French aeronautic works of note are:

L'Aviation Triomphante.—By Messrs. d'Estournelles de Constant, C. Bouchard, E. Lavisse, P. Painleve, Louis Blériot, Paul Rousseau, Captain Ferber, Comte de Lambert, Pierre Mille, etc., etc.

Eiffel.—Recherches expérimentales sur la résistance de l'air.



THE TAIL OF THE SHORT-WRIGHT BIPLANE, USED BY THE HON. C. ROLLS, AT NICE, SHOWING THE ADDITION MADE BY THE ENGLISH BUILDERS TO THE ORIGINAL WRIGHT DESIGN, OF A FIXED HORIZONTAL SURFACE AT THE REAR.

ROLLS' RACING NUMBER, SO CONSPICUOUS ON THE RUDDER, PROVED A VERY LUCKY ONE.

Saconney (Capitaine J.-Th.)—Cerfs-volants militaires.

Paul Painlevé. L'organisation en France de la Locomotion Aérienne.

Calderara et Banet-Rivet.—Manuel de l'aviateur-constructeur.

Les Aéroplanes de 1910. By R. de Gaston, Secretary of the Société Française de Navigation Aérienne. (Edited by the Librairie Aéronautique, Paris.)

This latter work is an interesting technical publication, which includes the data of the best-known apparatus, arranged in alphabetical order.

A large table gives a very complete description of fifteen types of aeroplanes which should be of efficient help to the reader for comparative work.

Germany

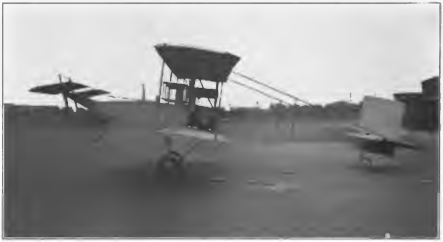
Count von Zeppelin invited Colonel Roosevelt to take a trip in one of his dirigibles during his stay in Germany, but the latter was unfortunately unable to accept, through lack of time.

It is certain that the Colonel must have greatly regretted his inability to accept the invitation: it would have been a far more exhilarating and also safer experience than going down in a submarine—as he did some years ago.

The new rigid dirigible Siemens-Schuckert was inspected recently in its great revolving hangar at Biesdorf, near Berlin, by General von Lyncker, Commandant Gross, Commandant Sperling, Captain Gena, and General Commandant Basenach, the three [illegible] h. p. motors were tried out at different speeds, the trials being very satisfactory. The Siemens-Schuckert has three cars and six propellers.

The loss of the "Zeppelin II," which broke away from the soldiers in charge during the storm of April 18th, is in no way as keenly felt as was that of the "Zeppelin III" in 1908.

THE ROW OF AEROPLANE SHEDS AT NICE: THE FLAGS INDICATE THE NATIONALITY OF THE AVIATORS: GRADE, GERMAN; EFIMOFF, RUSSIAN; DURAY, BELGIAN; CHAVÈZ, PERUVIAN; OLIESLAEGERS, BELGIAN; ROLLS AND RAWLINSON, ENGLISH; LATHAM, FRENCH; SWENDSEN, DANISH; ETC. DE RIEMSDYK IS DUTCH; IT IS NO DOUBT BECAUSE HE DRIVES A HERRING-CURTISS BIPLANE THAT THE STARS AND STRIPES ARE ABOVE HIS SHED.



THE NEW RACING VOISIN BIPLANE FITTED WITH AN E. N. V. MOTOR; IT IS SAID TO FLY AT SIXTY MILES AN HOUR.

THE USUAL VERTICAL PARTITIONS ARE REPLACED BY AILERONS.

It is well realized that, compared with the "Zeppelins" now nearing completion, the "Zeppelin II" must be looked upon as more or less obsolete.

The collapse of the dirigible hangar at Munich on April 14, entailing the death of two and injury to fourteen, emphasizes once more the difficulty of building these huge structures of sufficient strength, while the series of accidents to spherical balloons were plainly attributed to negligence; they can be accurately explained away by the saying: "Familiarity breeds contempt."

This great number of accidents to German lighter-than-air craft in the last few weeks, has somewhat turned opinion in the direction of aeroplanes.

The Minister of War has offered prizes aggregating $4,500 for the best altitude and passenger-carrying performances made by German subjects in German-constructed aeroplanes, during aviation week, at Johannisthal next August. A similar sum will be contributed for the October meet.

There is a great deal of flying going on around the main German cities, either on domestic or imported machines.

On April 11th, Jeannin, driving a Farman, made a flight of two hours and one minute, which, with the exception of Rougier's great effort of October 1st (2 hrs. 41 min. 36 sec.), is the longest one yet performed above German soil.

The Parseval monoplane—one of the largest aeroplanes in the world fell into the lake over which it was manœuvring the other day, but without harm to the aviators.

Pega and Emich, of Griesheim, are building a six-plane machine designed to carry six to eight people and to be furnished with an 80-h. p. motor.

On May 3 Wiencziers flew from the aerodrome, outside Strasburg, to the city, and twice encircled the steeple of the historical cathedral, on his Antoinette.

It is interesting to recall that the only other over-town flight ever made on this most bird-like of aeroplanes also took place in Germany when Latham flew last October from one aerodrome to another, over the suburbs of Berlin.

Holland

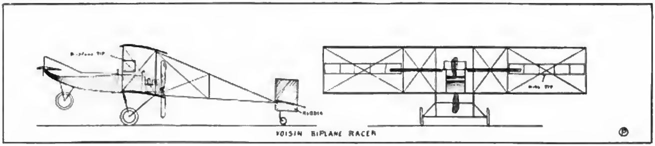
A peaceful invasion was made of Holland, or rather of the Dutch atmosphere, on the afternoon of April 18th, by the German Imperial air-cruiser "Zeppelin II." Intricate evolutions were made over the town of Vaals before the great ship returned to Cologne; this was but a few days before the partial destruction of this dirigible.

Hungary

On June 1st the entries close for the Buda Pest aeronautic fortnight under the rules of the Fédération Internationale. The jury consists of six Hungarians and six members of other nations in order to ensure absolute impartiality. The Touring Competition is the chief event on the programme, with a prize of 100,000 kroners, but all the other races are likewise well looked after as far as the prizes are concerned.

India

AIRCRAFT expressed some doubt last month as to the authenticity of a news item received from India. It is now learned, however, of a resident of Trichinopoly, in South India, that it was a large gasoline-driven motor that flew on the Maidan, near Calcutta. The full-sized machine shown in the picture published last



VOISIN BIPLANE RACER

month had apparently not made a flight at that time. It is the property of Mr. C. d'Angelis, of Madras. The first flight in India is therefore yet to be heard of, but, judging from the activity displayed there, it is only a matter of weeks or perhaps days.

THE NEW SPANISH DIRIGIBLE "ESPANA."

Italy

The Aviation Clubs of Rome, Milan and Turin have "got together" and formed the "Aero Club of Italy," with Sig. Rava-Sforni as president.

The new organization will control the sport of aviation in Italy, while the Societa Aeronautica Italiana will confine itself to aerostatics.

A committee, known as the "General Committee of the Societa Aeronautica Italiana"—which is the official representative of Italy in the International Federation—will, in the future, govern Italian aeronautics.

The committee will include delegates of: a, clubs interested in aviation exclusively; b, clubs interested in aerostatics exclusively; c, clubs interested in both heavier, and lighter-than-air craft; d. the Automobile Club of Italy (in charge of aero-engine experiments); e, the Touring Club of Italy (to attend to matters pertaining to aerial touring).

The Governors of the S. A. I., of which Prince Borghese, the indefatigable and popular sportsman, is president, must be highly complimented on the formation of this General Committee, including as it does, representatives of every industry connected with the Art, and intelligently dividing and distributing the work of propaganda and the control of the experiments to be undertaken.

France, England, Belgium, to say nothing, of course of the U. S. A., were—and are—in trouble over the control of their respective shares of atmosphere, by different aeronautical and automobile bodies. Italy is the first among the nations represented in the International Aeronautic Federation to take the radical and wise step of allotting each body its appropriate share in managing aerial matters and giving a chance to all bona fide volunteers to cooperate to the real progress of the Art.

Luxemburg

Aeroplane flights are being made in the Grand Duchy by Wiesembach on his Voisin. An aviation field with hangars and repair shops were placed at his disposal by Mr. C. Bettendorf.

Monaco

At the recent motor-boat meet one of the most interesting craft seen in the harbor was a combination machine which might be called a hydro-aeroplane; it is a light, flat-bottomed boat, with wings, aerial propeller and aerial rudders; its inventor claims for it that it can navigate both air and water with equal facility.

Another craft built along the same general lines is that of Henry Fabre, of Marseilles.

New Zealand

Mr. G. H. Smith, of Smith & Dorey, Ltd., London, recently heard from a New Zealand firm that they had given up the automobile business and were now devoting their time to aeroplanes. Such a thing will no doubt be a common occurrence in a not very distant future; but, if authenticated, this is the first case of such a thing being done which has come to our notice.

It is only one more sign of the extraordinary progressiveness of our friends in the Antipodes.

Portugal

The latest aviator to visit Lisbon is Taddeoli; the aviation craze is as rampant in Portugal as in any other country on the Continent, and the recently formed Aero Club of Portugal is gaining recruits daily.

Roumania

The firm of Cerkez & Co., of Bucharest, is taking up aviation. It is making a regular feature of aeroplanes and their accessories and has acquired an aerodrome of its own.

Russia

Russia's aero week is not dead after all, as influence has been at work to secure the necessary funds, and now the financial success of the aeronautic meeting may be looked on as established. The date fixed (June 5th to 9th) includes the latter half of the Motor Salon, which also takes place at St. Petersburg. A number of French entries is expected, and it is also quite likely that the German aviator, Hans Grade, will compete. A fillip is to be given to the enterprise by flights by the Farman aeroplane and ascents by the Parseval airships, belonging to the Russian military authorities. The Parseval is not yet finished, but it is regarded as a certainty. The other three airships owned by the Army, "Kommissionny," "Lebedj" and "Utchebny," will hardly be able to ascend, as they have to be rebuilt.

Guyot's second trip to Russia was far more extensive than his first: the interest in aviation has increased to such an extent all over the empire, in the last six months, that not only does his itinerary include St. Petersburg and Moscow, but also such towns as Warsaw and Nijni-Novgorod.

Outotchkine, the erstwhile champion cyclist of Russia, like his fellow citizen, Efimoff recently, has been flying at their native city of Odessa.

Spain

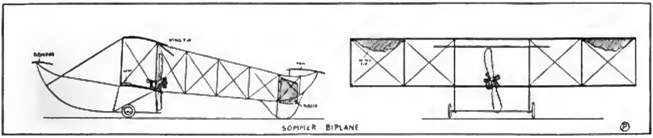
Gaudart, after making some marvellous flights at Barcelona, over the city, moved to Madrid. On April 19th, owing to the high wind, he hesitated about flying and made only a few jumps, whereupon the huge crowd of 50,000 people became furious and invaded the track, threatening harm to both machine and man; it was with difficulty that they were held back.

It is curious to note that this experience has occurred to various aviators all over the world, the first case being that of poor Delagrange, who narrowly escaped harm at the hands of a howling mob, outside Rome, on May 25, 1908.

THE SOMMER BIPLANE, FITTED WITH A GNÔME MOTOR, THE ONLY HEAVIER-THAN-AIR MACHINE WHICH HAS EVER CARRIED FOUR PERSONS ALOFT. SEE PAGE 146, THIRD COLUMN.

Switzerland

The Swiss aviator Speckner was somewhat badly hurt in a fall sustained on April 20th, when flying near Geneva. His recovery is assured, but the Blériot is badly damaged and may prove beyond repair.



SOMMER BIPLANE

A LADY WRITES FROM NICE

LEARNING from a contributor to, and friend of, AIRCRAFT, that his wife had written him interesting accounts of the aerial doings at Nice, the Editor obtained his consent to publish the following breezy excerpts:

April 12, 1910.

. . . "We finally got here on the 8th, after being delayed quite a while at the frontier, about the tryptique. You can imagine how familiar the last few miles seemed.

"We had intended going by La Turbie, but took the lower road when we heard the motor-boats sputtering in the distance; you probably know much better than I just which race it was, so I won't try to tell you but I do know we saw the "Ursula" go by at forty miles an hour or whatever it is she goes—it was simply uncanny, and the roar of the engines,—well, just think up an extremely noisy comparison; I can't think of one sufficiently so. 'His Grace' of Westminster in the stern—if that was he—looked mightily wet and uncomfortable, and I can't see how he and the others weren't made stone deaf.

"We didn't stop at Monte, as S. had something on here she was already late for.

"It is of course more or less the 'nether extremity of the season,' as that terribly brilliant B. puts it, but an awful lot of people are turning up for the flying and the place is packed with aeroplane-mad people in every walk of life: I thought you were pretty bad!—but I 'take it all back': B. picked up a man at the Cercle whom he brought here to lunch with us—speaks French with an Italian accent, but has a Spanish name which I forget—well, he talked Blériot and Antoinette until we harmless females got positively dizzy and felt afraid the motor would stop and we would 'miss our glide';—a genuine fanatic. His idee fixe is monoplanes and it is as much as one's life is worth to put in a kind word for the despised 'zweidecker,' as the Germans call them. There are lots of Germans here, by the way,—to see Grade fly, I suppose;—so many, in fact, that the 'Promenade' should temporarily be christened 'des Allemands' instead of what it is. Speaking of the Promenade, I saw Rougier yesterday; recognized him by his nose, which has not changed in profile since we saw him driving the de Dietrich at the Grand Prix; it appears his friends call it his 'gouvernail de direction'—it certainly is just the shape of a rudder.

"They say his flying at Monte was marvellous; he had to start in that first little street you get to in the Condamine coming from Beaulieu; just imagine it. Everyone seems to think he'll win all the prizes here; the races start Friday; they are already practising, but I haven't been out as yet; I thought they were to fly at the race-track (will you ever forget the crush when we had to go out by train?), but it is to be on the beach, out at La Californie.

"The man who lunched with us—see above!—said we would soon be going to the races in monoplanes and S. said she would wait until it was so safe that the chances of her having her 'face spoilt' on the trip were one to a million; he agreed volubly that it would be an outrage . . .

"April 16, 1910.

"The unexpected has happened (as it usually does!) Your T. is an aero-lunatic. I went to the meet this afternoon; it was wonderful:—a peerless day, a light, steady breeze, a sky and sea—well, you know what it is like here on such days: such light, such coloring. . . .

"We got out at about three; Efimoff and Chavez were already rushing overhead and then Van den Born came out, and the Russian, the Peruvian and the Belgian tore around on their Farmans, at an unvarying height, just like so many toys on a string; the motors made such a noise that the marine band was completely overpowered, although the Gnômes are not as noisy as some of the other engines. The only drawback was the smell of the oil; someone said they used castor-oil; is this true?

"I was awfully clever! I knew the Farmans and Voisins apart easily and had as much to tell the others as you have to tell me.

"You should have seen Efimoff take the corners; he must have covered fifty miles just while we were there. It was getting to be positively monotonous when Olieslaegers rose in his tiny Blériot—at least it looks tiny next to the big biplanes—. It is so much more graceful than the biplanes and looks just like a big gull—of the kind that follow the steamers.

"Olieslaegers is just as wonderful at flying as when we saw him at the Vélodrome d'Hiver, but his flying looks much safer than his motor-cycling. He has wonderful control and they say there is no one who can drive a Blériot like he: I could just imagine Blériot himself crossing the Channel when the little monoplane soared over the water's edge. Sometimes it seems almost too wonderful to believe.

"I wanted to go up madly, but, as I told you, I won't even if I get the chance.

"I feel so, so enthusiastic—just like the man you told me about two years ago, who hastened to write an article to inform the world, before it became an every-day occurrence, that 'he had seen a man fly.'

"It was so much more wonderful than at the Jamaica Track and at Governor's Island, because there were so many of them and they followed the course with such astonishing accuracy. The Voisins seemed very steady, but they don't take the corners as sharp, and lose a lot of distance that way.

"The Antoinette didn't go up, much to our disgust; but I saw Latham in a very raggy begrimed 'mecano' suit, smoking his 'eternelle cigarette'; he was quite unmistakable." . . .

April 20, 1910.

"Why aren't you here? It is getting more astonishing every day. I don't know what to say or where to begin. They are all flying and getting in each other's way, encroaching on each other's air, passing over and under and around each other, flying three abreast—in a vertical sense: one above the other. It is like a dream, and yet it looks so easy and so natural; it was the August before last that we saw Farman making little silly jumps at Brighton Beach; if they progress at that speed, what will people be doing three or four years from now?

"The course is too small to accommodate all the flyers at one time, and, as I say, they have been flying 'in layers'; as we left to-day the inevitable Efimoff and Van den Born were skimming along a few feet above the ground; Olieslaegers and Grade were up a hundred metres or so, and, far above, the Antoinette was soaring, but I can't describe it: it is the ceaseless motion in the picture which is so fascinating, the hum and rattle of the motors, the glint of the whirring propellers and that sky and sea—a symphony of blues.

"Poor Grade fell into the Var to-day: I don't know what the trouble was; the day before yesterday Rougier fell in the sea; it was certainly exciting, but it is astonishing there are no real accidents with so many flying together.

"I certainly enjoyed the day. I brought Pam along! She disapproves of aeroplanes and voiced her feelings in indignant barks; no one takes her seriously here, as she looks so unusual; but to-day when she barked I heard an unmistakably transatlantic voice enounce: 'Back to Boston for yours!' Murray was most indignant when I told her about it (I think she looks upon herself as Pam's nurse, quite as much as my factotum).

"Although it isn't allowed (verboten!), Olieslaegers flew right over us in the Club stand to-day: L. B., who was sitting in front of me, gave a most un-baronne-like squeak and clutched hold of Mr. L.; the latter would, of course, have liked a regular passage of the big birds over his head after that—as causes of such a result—; the incident has much kindled his languid interest in the flying.

"Everyone has been flying over the sea to-day; Van den Born was skimming along for miles just a few feet above the water.

"What a delight it must be!"

BRITISH AERONAUTIC NOTES

Written especially for "Aircraft" by C. G. Grey, Editor of "The Aero," London

CONSIDERABLE progress is being made in aviation in England as regards both construction and actual flying. British aeroplane factories are developing everywhere and showing considerable activity.

At Sheppey the Short Brothers have turned out some half-a-dozen Wright machines which are all doing well. McClean, Ogilvie, Percy Grace, of San Francisco, Egerton, and Rolls all learned to fly on these biplanes in their original form, i. e., without tails; the machines are now being fitted, however, with a small tail, which is rigged up behind the rudders. This tail, which is about 10 ft. spread by 2 ft. deep has of course a marked effect on the natural longitudinal stability of the machine. On Good Friday I was down at Sheppey watching Rolls flying and nobody would have recognized his machine for a Wright unless they could have seen the actual design of it. Instead of the typical up-and-down dipping of the classic Wright machine, it flew with all the steadiness of other biplanes, and this, in spite of the fact that there was an extremely gusty wind blowing, which made the machine rise and fall perfectly vertically owing to the variations in pressure under the entire lifting surface.

It may not be generally known in the States that the Wright machines as built by Short Brothers are loaded in quite a different way from those built by the Wrights themselves, and by the French Wright Companies. In the Short machine considerably more weight is put on the biplane elevator, with the result that it has a greater angle of incidence than the main planes; this is done with the idea of increasing the stability. In the Continental and American machines the machines are practically balanced on the main planes, and although the front elevator is more of a carrying surface than it is on other biplanes, it does little more than act as a horizontal rudder. Owing to there being no tail to act as a damper in these biplanes, the Shorts hold that the elevator acts too quickly and that it is this "tenderness" of the machines which has given rise to accidents with the original Wright type.

Messrs. Short have also turned out a biplane to the design of Captain Dunn. In plan this very original machine is laid out in the shape of a widely obtuse V; it has neither tail nor elevator—the stability usually derived from a tail being expected in this case from the backward slope of the wings. Gliders and a power-driven machine of a similar type were experimented with by Captain Dunn and by Mr. Launcelot Gibbs, of the Artillery, at Blair Athol, in Scotland, last year, with a certain amount of success. Captain Dunn's machine has now succeeded in rising from the ground, but has made, so far, no extended flight.

At the Olympia show the Short Brothers showed a new biplane of their own design, which was certainly one of the very finest machines there. This machine has planes similar in shape to the Wrights, but the whole machine is much smaller. Its main characteristics are a large fixed cruciform tail somewhat like that of the Curtiss, ailerons between the wings, a biplane elevator and a long narrow rudder immediately behind the elevator. The machine has skids somewhat like those of the Wright, but it is also fitted with wheels. These wheels are so arranged that when the machine leaves the ground, the aviator, by pressing a catch, can release them so that they fly up above the skids, which thus are left to support all landing shocks; when it is desired to start again the winding up of a small winch attached to the wheels will bring the machine on to the wheels again.

Flying in England has been confined during the last two months very largely to the Royal Aero Club's grounds at Sheppey, where Percy Grace, Egerton, Moore-Brabazon and Rolls have done some excellent flying. The longest flight, which, unfortunately, was unofficially observed, was that of Mr. Brabazon, when he flew forty miles on his Short biplane; the most impressive flight, however, was that of the Hon. C. S. Rolls, who, on the Thursday before Easter, brought out a brand new Short-Wright machine, fitted with a tail, and flew across from the factory at Shellness to the flying ground at Eastchurch. After a short stay there he started afresh, flew over to Queensborough at the other end of the Isle of Sheppey, rising steadily all the way until he reached a height (registered on his aneroid barometer), of one thousand feet. He then came down at Eastchurch, having covered in all a distance of twenty-six miles and having reached, as I have said, a height of a thousand feet: a truly remarkable performance for a machine which had never been off the ground until it started on this fine flight. Mr. Ogilvie, down at Camber, on the South coast, has been doing a good deal of flying over sand and sea, his flights varying in duration, up to half an hour. Unfortunately he has had a deal of engine trouble, and has completely wrecked his machine on one occasion through a connecting rod blowing out through the side of the crank-case and forcing him to come down "all anyhow."

Another new aviator is Captain Sanders, late of the Merchant Service, who, with his brother's assistance, built a large biplane at Lowestoft, and fitted it with an engine specially built for it by Brooke & Co., the well known motor-boat engine people. He made several flights of over two miles with this machine, but on one of these unfortunately ran into some telegraph wires, as a result of which the machine turned over and was wrecked.

Another busy factory is that of Mr. Howard Wright, who has recently been specializing in monoplanes. A machine built by him for the Hon. Alan Boyle, has made several short flights over the Brooklands motor track, and another one built for the Aeronautical Syndicate, Ltd., got off the ground at its very first attempt over Salisbury Plain. This machine which is known as the "A. S. L." is extremely original in appearance; it is fitted with wings similar to those of an Antoinette, but the small plane which would, if the resemblance were fully carried out, be a tail, is really the leading plane. In fact the machine operates very much on the lines a Wright monoplane would, if such a craft existed. Great things are expected of this aeroplane, and as Mr. Barbour, the manager of the Aeronautical Syndicate, has spent many years studying aviation, it has a good chance to become a popular type of flyer.

Some good flights were recently made at Wembley Park, near London, by the French aviator, Taurin. He brought over a Blériot monoplane on which he had previously flown near Algiers when Métrot was flying there on his Voisin. Though the ground at Wembley is quite an unsuitable one for beginners, it is not so bad for a really skilled aviator; there is a good starting and alighting ground, and a clear space on the side of a hill to fly around. Taurin made several flights whenever the weather was fine, and those who had the good fortune to see him were much impressed. Unfortunately the average Englishman is such an utterly apathetic being that only a few hundred people turned up each day, instead of the thousands, which a similar exhibition on the Continent would have called out. Some day in the near future, the country will wake up, and will then be just as foolishly hysterical over everything aviatic as it is just at present apathetic.

In aero engines great progress is being made and if the number of engines sold at Olympia is any criterion of the number of machines being manufactured in the country the total figure must run into the thousands.

Great firms like the Thames Iron Works Co., and Vickers Sons & Maxim are turning out splendid engines, especially designed for aviation purposes. Mr. C. M. Smith, the manager of the motor department of the Thames Iron Works, is particularly to be congratulated on the excellence of his first attempt at designing an aero engine; this motor is a four-cylinder opposed horizontal engine with copper water jackets, and gives 35 H.P. for a weight of 150 lbs.

The Wolseley Company, which is owned by Vickers Sons & Maxim, are turning out two aeronautical engines, a 60 H.P. eight-cylinder V type weighing 340 lbs., and a 30 H.P. four-cylinder vertical, weighing 210 lbs.

Another motor which caused considerable comment at the recent show was the Lascelles, a four-cylinder air-cooled engine with the cylinders set fanwise at angles of 45 degrees from each other. It is in fact a kind of modified Anzani—an Anzani with an added cylinder.

The Green engine which is being used with so much success on the Army Dirigible, and also on the Short biplanes (but not on the Short-Wrights, which have French engines) has been improved for 1910, being strengthened in some places and lightened in others; it is now undoubtedly one of the finest engines on the market. In this, the copper jackets, instead of being electrically deposited, as in many engines, are simply spun out of copper sheet, and are forced down over rubber packing rings on the sides of the cylinders; it is found that this makes perfectly water-tight joints, even when there is considerable pressure on the water.

Probably the lightest engine at the Aero Show was the "Alvaston," a double cylinder (opposed horizontal) engine which, with a bore of 132 millimetres and a stroke of 127mm., gives 30 H. P. for 112 lbs.

The exhibit of actual aeroplanes at the Show was chiefly notable for the absence of freak designs. The prevailing type was more or less a copy of the Cross-Channel Blériot, but there were quite a number of original machines on view: the biplane shown by George & Jobling of Newcastle has many excellent points, including a new system of springing the wheels. Mr. A. E. George is well-known as an expert driver of racing cars.

The Humber firm, the makers of the well-known Humber cars and cycles, who have gone in heavily for aviation, showed a machine designed by the late Hubert Le Blon, in which the usual fusellage was replaced by a long wooden cylinder, or rather a cylinder made of a wooden frame covered with canvas; † this marked quite a new departure in aeroplane design, and one which will doubtless be largely followed in the near future. The Roe triplane which is, I believe, the only machine in the world * to have flown with a 9 H.P. engine, attracted a good deal of attention.

At present the aviators of this country are greatly concerned with the possibility of acquiring first-class flying grounds, and already there are many schemes on foot to provide them. The Motor Union which recently absorbed the Aeroplane Club (turning it into the Aviation Section of the Union), is in treaty for a very large ground near London which will afford a five-mile circuit; it is intended to erect enormous grand-stands as well as repair shops and hangars, on this ground, and as it is within half an hour of the centre of London it should become practically the aeronautical centre of England, provided no snags are struck in completing the negotiations.

The British Michelin Cup, which is the most important Aviation Trophy offered for competition in Great Britain, has been won by Mr. Moore-Brabazon with an 18 mile flight. He himself, with a 40 mile flight, Rolls with a 26 mile flight, and Grace, with a 20 mile flight, have all beaten the distance, but none of these performances were officially observed.

Ed. Notes: † See page 146.

* The Sellers quadriplane of Baltimore has flown under the propulsion of a 4-6 H.P. engine.

THE WRIGHT COMPANY IS AN INCENTIVE TO THE DEVELOPMENT OF AVIATION

By John G. Hanna

THE April number of AIRCRAFT contained an excellent statement of the plain facts in the Wright patent case, by Mr. Campbell Wood. To the mind of the writer this article is by far the best and fairest account of the trouble that has so far appeared anywhere, and AIRCRAFT is to be congratulated on receiving it. In the May issue appeared two partisan accounts of the same matter by the respective attorneys. Unfortunately, both of these latter articles appealed rather to passion and prejudice than to reason. It is the purpose of this article to sum up the case in a fair, reasonable, impartial way, from the viewpoint of the ordinary layman who is not financially interested in either side of the suit.

It seems, and it is sincerely to be hoped, that all attempts to invalidate the Wright patent will fail. Undoubtedly other inventors conceived the idea of warping wings before they did, but it is the peculiar discovery of the manner in which the vertical rudder and the warping device must be used together that made successful flight possible. So far it has not been shown that any one had worked out this system previous to the Wrights. The reason is evident. It is an empirical principle, to be discovered only by actual experiment in the air, as they discovered it, and not such an idea as would be developed in the paper theories of their predecessors.

Even though it can be shown that some previous inventor had some such idea of control, and even though the Wrights knew of the previous inventor's work, it cannot be denied by the bitterest opponent of the Dayton brothers that they were the first to make successful use of it in flight. By flight no one means a jump for a hundred feet at a few inches above the ground. Because they were the first inventors to put this principle to actual use in a practicable form, Judge Hazel and Judge Hand have very rightly held that they are entitled to the exclusive use of it for the usual period of a patent. The same law has always been held valid in all other patent cases. It is quite true that other inventors had some hazy ideas of both the telephone and the gasoline automobile before Bell and Selden applied for their respective patents; but because these inventors were the first to make actual and practical use of the ideas in a commercial form the courts have steadily upheld them in their rights to the exclusive use of the devices.

Perhaps an illustration of an analogous case will make the matter clearer. In 1849 many thousand people knew there was gold in California, and made plans to go after it. All of them, through their knowledge and efforts to obtain it, had an equal right to it. Yet the Government invariably granted a land patent to the first to get to a good place and begin to make actual and commercial use of the ground. That the hundreds of unsuccessful ones who spent sums of money greater than were ever spent on the development of aeroplanes, and who toiled to exhaustion many more hours than did all the inventors together, got no share of the gold dug up by the more skillful and daring pioneers, was not considered unjust. All governments in all ages have granted such land patents, and no one has ever tried to show that such grants are not fair. The present patent case is exactly the same in principle. If the hundreds of other inventors who have been struggling toward this gold mine find the Wrights already actually operating it on their arrival, there is nothing for them to do but turn in another direction and seek for another vein of ore. And this they can certainly find, for be it remembered that the Wright patent covers but one very definite and not very perfect type of aeroplane, and there are any number of better and more profitable devices lying around in the wilderness, so to speak, waiting for the independent prospector to seek them out and claim them for his own.

From the foregoing it appears how useless, as well as how unjust, it is to attempt to break the Wright patent. The proper course for Paulhan, Curtiss and others is to attempt to show how their aeroplanes do not infringe the Wright claims. As pointed out by Mr. Wood and by Mr. Ludlow, the essential feature of the patent is the combined action of the warping and rudder. If either part of the combination is dispensed with or rendered unnecessary, then there is no infringement.

Curtiss claims that his ailerons balance each other so as to render correction by the rudder unnecessary. If the inventor would proceed to demonstrate this fact at once by actual flight in the presence of representatives of the court, instead of wasting time on attempts to undermine the Wright patent, he would probably be henceforth declared free to pursue the manufacture and operation of his really clever little machine without molestation from the Wrights or anyone else.

Paulhan claims that the peculiar loose attachment of his ailerons causes them to offer no retarding effect when drawn down just sufficiently to produce the necessary lift. No retarding effect means of course no concurrent use of the rudder and hence no infringement. This claim seems somewhat doubtful. Still it is more likely to help him if he proves it than if he spends money and time in fruitless attacks on the Wright patent.

Paulhan's Blériots were originally equipped with regular wing-warping devices, like all of the type. If equipped thus, they are plainly infringements, since corrective action of the rudder will certainly be necessary. Before coming to this country, however, Paulhan claims to have removed the warping wires from the wings of all of them. No better proof of the sincerity of the Wrights and their intention to mind strictly their own business and their own system of control can be desired than their public declaration that Paulhan might use these modified and non-infringing Blériots freely without fear of molestation by them.

So much for the Wright patent and the cases of Paulhan and Curtiss. It is next in order to consider the Wright Company and its attitude towards and effect upon aviation.

Mr. Ludlow says that the Wright patent is "a power of injunction, a possible monopoly, which, owned by a covetous and rich corporation, might threaten the very life of aviation, stifle development in this country, and bar out the fruits of foreign progress." It is hard to imagine a more extravagant statement. The patent *is* a power of injunction and a monopoly only of one type of machine. Paraphrasing the old saying that "one swallow doesn't make a summer," it is quite true that one type of aeroplane doesn't make aviation. Instead of stifling development in this country, it will accelerate it, for inventors will be forced to devise some other type of machine to get around the patent claims. As it is, if the Wrights did not rigorously enforce their patent, we would be too prone to be satisfied with the several good-enough machines we now have, and consider it unnecessary to devise better ones. This has been the case with all other inventions. The first form, though imperfect, was used, perhaps for years, until a monopoly forced others to invent something better, when the original was improved to keep pace with the new invention. As to barring out fruits of foreign progress, perhaps it would be well to wait until foreign progress shows some fruit before worrying about this. It is a fact that the success of practically all the better-known foreign flying machines dates from the day they began to profit by the fruits of American ingenuity. However, foreign inventors will without question produce some very valuable work in the near future, surpassing what they have already done, and it would be folly to bar it out. The point is, the Wright patent cannot bar it out so long as it is really fundamentally different from, and not a structural variation of, the Wright machine.

A case in point is the well-known Voisin biplane, which has recently shown such excellent balance in high winds while piloted by Rougier at Monaco. This machine claims entirely automatic lateral stability, and has absolutely no means for changing the angle of incidence of either of the main planes. The Wright patent, therefore, does not bar it out, and anyone can fly a Voisin biplane over every square inch of America without a word of protest from the Wrights. The same is true of the Blériot and of Santos-Dumont's "Demoiselle" without the wing-warping devices.

The statement that the Wright Company is willing to license all users of infringing aeroplanes should be taken at its full value. That they have yet made no announcement of their rate signifies nothing. Remember that the suits against Curtiss and Paulhan have not yet been settled definitely. Until the courts definitely declare that their patent is valid and that the other machines are infringements, how can they be expected to announce a price for what they may ultimately have no right to sell at all if the decision goes against them?

Referring to the statement of the Wrights that they will not bring suit against those who use their type of machine purely for experimental purposes, Mr. Ludlow says this statement "is interesting, but of no particular value." It *is*, it most certainly is, of the utmost particular value. For until Mr. Ludlow or some one else proves it false, this one sentence is enough to acquit the Wrights of every word of the long list of charges of stifling competition, hindering the development of aviation, barring out the fruits of foreign progress, and so forth, that have been brought against them. It means simply that they are giving to everyone the fullest possible opportunity to beat them at their own game, and to advance the science of aviation by building on the foundation of the Wright machine a better one that will vastly lessen the value of this patent. And it is a fact that the Wrights have, as Mr. Toulmin says, time and again helped other inventors in their efforts to produce machines of a different type. How such a course menaces the development of aviation, as Mr. Ludlow asserts, is hard to see.

The case of the Wrights and the French War Office has no bearing on the Paulhan-Curtiss suits; but, since counsel for Paulhan has seen fit to introduce it, it may be well to give the real facts in the case. The first idea of the Wrights, even before their first machine was completed, was to sell it to the United States Government alone, keeping the secret from all others. With patriotic self-sacrifice they offered it at a price not a tenth of what they could get by selling it to other governments or developing it commercially throughout the world. But our supremely wise and omniscient Government, blind then as now to the real status of aviation, turned them down with scant consideration. Then, and only then, were they forced to take their invention to a foreign market. Mr. Ludlow seems to imply that they had transgressed the rights of this Government, for which the said Government should take away the rights previously granted them. Yet it is as simple as two plus two make four that it is impossible to transgress the rights of a party which has no rights to be transgressed. And by this colossally stupid blunder the American Government had not only forfeited all its own rights in the case but as well trampled on the rights of the inventors and of the whole nation. No amount of gold medals and present orders for machines can ever atone for the action of the Government when it was first given the opportunity of purchasing the Wright patent, years ago. Every loyal American must think with admiration of the self-sacrifice of the Wrights and with shame of the stupidity of the Government.

Mr. Ludlow says further that the Wright Company "is attempting to impose an exorbitant tax upon the community for the use of aeroplanes, and is claiming a monopoly for selling, making, using, or exhibiting aeroplanes." It is difficult to find words to fitly characterize this statement. As every schoolboy knows, the word "aeroplanes" does not in any way refer exclusively to the Wright type of flying machines. Such a statement is therefore an insult to the intelligence of every reader. Further, it is certain that the Company will not impose an "exorbitant tax" for the use of Wright machines, simply because competition of other types will make this bad business policy. Nor will it try to keep a monopoly of the manufacture of this type. The demand for machines is growing at such a pace that no one company can keep up with it, though it be a million-dollar corporation.

Since it cannot take all the orders itself, common business sense will move the Company to take what royalties it can from other companies, exactly as was done in the case of the Selden patent. No effort was made to obtain a monopoly-profit from this patent, but a royalty of one-eighth of one per cent. was asked and received from practically every manufacturer of cars coming under its scope. It is well known that immense profits have been made in the automobile business, profits quite satisfactory to million-dollar corporations, yet every cent of them were straight manufacturing and not monopoly profits. The same holds true of aeroplanes, which are even simpler in manufacture than automobiles. Any royalty or monopoly-profit that might be made would be utterly insignificant beside the legitimate return in manufacturing. Even if the Company reserves to itself the exclusive right to manufacture all such machines, it can never force up the price, for if it goes much above the average level of the prices of the Voisin, Herring-Burgess, Baldwin, Blériot, "Demoiselle," and other machines that may be operated here, then the public will naturally cease to demand them, and as a result the price will drop to the normal level.

Such, then, is the position and the attitude of the Wright Company. What will be its effect on aviation? Instead of being a menace, as Mr. Ludlow claims, no logical and farseeing person can consider it as anything but the most powerful and useful incentive to the development of aviation that we have to-day. The Wright system of control is a good one, but not the only good one, and not necessarily the best. In fact, it is not the only one used by birds, for various kinds of birds have entirely different means of maintaining equilibrium. The monopoly of the first system discovered will be a powerful incentive for inventors to work out the other and perhaps better systems. It should be remembered that two of the six fatal aeroplane accidents have occurred with Wright biplanes. In an editorial in the March AIRCRAFT the statement is made that "the Wright brothers owe their success to the thousands who tried and failed before them, and the success of others after them will be built upon their failures." No better summing up of the matter could be made.

As examples of what can be done in this line, consider the Pfitzner monoplane, which has been highly successful. It preserves its stability by changing the supporting area of the wings, instead of increasing the supporting angle. The Herring-Burgess biplane is also a success in every way, so far as tried. The fins on top provide a clever and apparently efficient means of automatic stability. Baldwin's aeroplane, with its vertical rudder on top acting to straighten the machine when it tips, is also outside the scope of the Wright patent. Among foreign machines there is the Voisin, with its stability preserved by vertical partitions like a box kite. The Blériot and "Demoiselle" monoplanes, without wing-warping devices and depending for stability on the dihedral angle of the wings and on corrective tails, are also outside the class of infringing machines. This is certainly a fine collection to start from. Every month AIRCRAFT has reports of new designs being worked out all over the country, and in a short time we may expect to see several very successful machines of original design added to the above list. It may easily be seen that the Wright Company has no monopoly of flying in America. The increased demand for machines of other types will spur inventors to greater efforts, resulting in a much earlier and greater perfection of the science of aviation than we should see if all the country were to be allowed to use and be satisfied with the present Wright system. And there are certainly plenty of other systems waiting to be discovered. Any person of a mechanical turn of mind, after making a thorough study of the principles of mechanical flight, should be able to devise some system of balancing that would be entirely practical. The thing to do, then, is to get out and test these ideas in actual flight, as the Wrights did, and then to improve and perfect them until they work with precision and certainty.

We have now looked at every side of the case. If this article seems favorable to the Wrights, it is only because reason and common sense are on their side, for an effort has been made throughout to keep it absolutely impartial. The Wright patent, it seems, is valid, and the patentees are justly entitled to all its benefits. The best course for Curtiss, Paulhan, and others is to show by actual demonstration that their machines do not operate in the same way as the Wright, or, if they do, to invent new ways of control. The Wright Company is not and cannot be in a position to monopolize or hinder aviation and flight as a whole, either in America or elsewhere. The attitude of the Company should prove a strong inducement to inventors to bring out new, better, and more efficient types of flying machines, and thus it will serve as an incentive to the development of aviation as a whole. There is the case in a nutshell.

THREE IMPRESSIONS

Miss Gertrude Bacon Describes the Sensations of Aerial Locomotion

(From *The Aero* of London.)

THE onlooker sees most of the game, and the passenger, idle, unhampered with anxieties as to the management of the craft, appreciates most fully the sensations of the voyage. As one who has sampled all three methods of aerial locomotion, I consider myself entitled to make comparison.

Only the point is that they cannot be compared. To ask which one prefers—to travel by balloon, airship or flying machine—is like asking if one prefers porridge, plum cake, or pâté-de-fois-gras. It depends entirely on circumstances.

SPHERICAL BALLOON.

To travel by balloon is the consummation of idleness, indolence, and drifting dolce far niente. No engine jars and roars, no muscles strain, nor harness jingles. No breeze stirs, and no waves lap. "Let go all," shouts the pilot, standing on the edge of the wicker basket, and eager hands relax their hold. What follows next is remarkable. After much experience I can confidently aver that the balloon does not move—does not so much as quiver. But the earth takes the opportunity to drop away underneath, and recedes further and further from below the perfectly stationary car and its mildly astonished but quite undisturbed occupants, and after that the world continues slowly to unroll itself in ever-varying but ever-beautiful and unusual panorama—patchwork fields, shimmering silver-streaks, toy box churches and houses, and white roads like the joins of a jig-saw puzzle.

And presently cotton wool billows come creeping up, with purple shadows and fleecy outlines and prismatic rainbow effects. Sometimes they invade the car, and shroud it for a while in clinging warm white wreaths, and anon they fall below and shut out the world with a glorious curtain, and we are all alone in fairy land, in perfect silence, in perfect peace, and in a realm that is made for us alone. And so the happy restful hours go smoothly by until the earth has had enough of it, rises up more or less rapidly, to invade our solitude, hits the bottom of the basket more or less violently, and we step out, or maybe roll out, into everyday existence a hundred miles or so away.

All the while the balloon has never moved, not so much as an inch. "What is the sensation of ballooning?" ask the uninitiated, and they seem to marvel that the answer is, "The sensation is the total absence of sensation." "But aren't you sea-sick?" they query, and you say, "How can one be when there is no motion whatever?" "But isn't it awful to look down?" they insist, and you reply, "Is it awful to sit in an armchair and look at a picture?" And still they don't understand, because they labor under the delusion that it is the balloon that has moved, and not merely the earth and the sky that have shifted themselves about for our delectation.

DIRIGIBLE.

But it is otherwise in a dirigible. True the aloofness of it all remains—the earth's sudden downward plunge, the matchless panorama, and the absolute impossibility of realizing one's true position in the scheme of the universe. But the drifting indolence is replaced by the joy of life and motion. A stiff breeze fans one's cheeks, the unfamiliar car quivers and vibrates beneath the feet, the propeller whirls in a flash of light, and the throbbing of the engine, the steering wheel, and the levers suggest another form of rapid transit.

An airship is a delightful blend of the balloon and the motor car—a combination of the chief pleasures of both. To the wearied, the jaded, the indolent, or the "bone idle," the dreamy restfulness and calm of the drifting gas-bag may be its greatest charm, and this in a dirigible is certainly most effectually banished. But in its place has come the breath of life, the living pulsing strength, the exhilaration of action, and swift vigor.

AEROPLANE.

The aeroplane excites—wildly, maddeningly. The balloon sense is entirely absent. The fact that the height ordinarily attained by a flying machine is inconsiderable may have something to do with this; but it may well be doubted whether even those few bold bird-men who have urged their craft to balloon altitudes have, by so doing, attained to the aeronaut's sensation, or lack of sensation, when riding a mile or so above the ground. The wonderful and inconceivable part about high flying to the balloonist is that he has attained his height without effort or knowledge. The aviator wins his upward way only by hard striving, and his feelings, if he has time for any, must be those of the mountaineer.

A flight in an aeroplane, in my own experience, is a time of stress and strain. It is cold, bitter cold, even on a sultry summer evening, for the furious gale of the onward motion blows through and through you, and makes your eyes smart and reddens your nose. It is deafeningly noisy. When I climbed down from the little basket seat of the Farman biplane that night at Reims the voices of Sommer and his mechanics sounded to my deadened ears as if they came from an immense distance away, and not for several minutes did I hear properly again.

An hour's voyage by flying machine would, even for a passenger, make a not inconsiderable demand on bodily strength and nervous energy. But, oh! the rapturous thrill of the swift plunge through air, the glorious exhilaration of the swooping flight, the sense that never until that moment have you felt what it is really to live!

One curious fact surprised me. Contrary to my expectations, I was absolutely unconscious of the exact moments of leaving and regaining the earth. A single turn of the propeller had started the engine (still warm from recent flight), and in a moment we were speeding along the grass at the rate of a racing car. By no movement or sudden shock was I made aware of what happened next; only presently there came into the motion a sense of lightness, floating buoyancy, absolutely novel and absolutely delicious. Yet so imperceptibly had the change come that it needed a downward glance to make sure that we were really in the air. Similarly, at the close of the flight it was only by the slackening of the engine that I learnt our voyage was over. No floating snowflake could have settled more lightly to the earth.

If life contains a more blissful experience than a voyage in an aeroplane, I have yet to discover it.

CLUB NEWS

Compiled by Ada Gibson

Aero Club of America

Agreement Signed between the Club and the Wright Company

THIS AGREEMENT, dated April 8th, 1910, made and entered into by and between the WRIGHT COMPANY, a Corporation of the State of New York, party of the first part, and the AERO CLUB OF AMERICA, a corporation of the same State, party of the second part

WITNESSETH:

WHEREAS, the Aero Club of America, as the representative of America, is a member of the International Aeronautic Federation, and as such, is the custodian of the Bennett Trophy representing the International Aeronautical Championship of the World, won at Rheims 1909, by the American representative, and

WHEREAS, under the rules of the International Aeronautic Federation, all contests held in America in which members or representatives of any of the Clubs composing the International Aeronautic Federation or clubs affiliated with such clubs are contestants must be held under the auspices, and with the sanction, of the Aero Club of America, and

WHEREAS, the Wright Company as owner of certain basic patents, heretofore issued to the Wright Brothers, has obtained from the Federal Courts decisions sustaining the validity of said patents, and injunctions forbidding the use of infringing machines by others, and,

WHEREAS, by reason of said decisions it is deemed essential that the concurrence of the Wright Company shall be obtained in order that successful open aeronautical contests may take place in America, and,

WHEREAS, in the interest of the development of aeronautical science and sport, it is desirable that an arrangement be made between the parties hereto,

NOW, THEREFORE, in consideration of the premises and of One Dollar by each party to the other paid, the receipt of which is hereby acknowledged, it is mutually understood and agreed by and between the parties hereto as follows

FIRST The Aero Club of America in recognition of the decisions of the Federal Courts sustaining the patents and invention of the Wright Company, as set forth in said decisions, and not wishing to encourage the infringements of said patents by others, hereby agrees that under its powers of sanctioning meets as above stated it will grant sanctions to such meets and contests only as shall be held under proper arrangements with the Wright Company.

SECOND The Aero Club will furnish judges, timers, etc., and all necessary facilities to the end that the records made at such contests duly sanctioned by the aforesaid Aero Club of America shall be accepted by the International Aeronautic Federation

THIRD: The Wright Company agrees that it will encourage the holding of open aeronautical meets or contests whenever approved as aforesaid by the Aero Club of America, by granting licenses for the use of its patents and inventions to the promoters or holders of such meets, under arrangements for reasonable compensation from them to it so that machines of any kind, make or country, without let or hindrance, may participate, under such license without further payment or liability, in such meet or contest for which said license has been granted

FOURTH This agreement shall continue as long as the decisions of the said Federal Courts of the United States shall sanction and uphold the validity of the said patents and inventions of the Wright Company.

IN WITNESS WHEREOF, the parties hereto have caused their corporate seals to be affixed and these presents to be signed by their duly authorized officers, the day and year first above written. Executed in triplicate.

AERO CLUB OF AMERICA,
[SEAL] By
CORTLANDT F. BISHOP,
President

THE WRIGHT COMPANY,
[SEAL] By
WILBUR WRIGHT,
President.

Intercollegiate Aeronautical Association of America

By George Atwell Richardson, President

ON Saturday morning April 30th, a convention was held in Houston Hall, University of Pennsylvania, for the purpose of forming an Intercollegiate Aero Association.

The following colleges were represented:

Cornell University, two delegates;
Princeton University, one delegate;
University of Virginia, three delegates;
Haverford College, two delegates;
Swarthmore College, one delegate,
Columbia University, two delegates;
Tufts College had a proxy present.

The Yale, Massachusetts Institute of Technology, Amherst, University of Chicago, Notre Dame, and Carnegie Technical School Aero Clubs, while unable to send delegates, sent letters stating that they were greatly in favor of the forming of the Association, and expressed their desire to become members.

The morning was taken up with discussing the constitution of the new association and with the election of officers. These are as follows:

President G. A. Richardson, U. of P., 1912.
First Vice President Cyrus McCormick, Princeton, 1912.
Second Vice-President—Dr. Bird, Virginia, Professor.
Secretary Elmer Rae, Cornell, 1913.
Assistant Secretary—Thomas Midgely, Cornell, 1911.
Treasurer S. S. Morris, Haverford.

The new association will be known as the Intercollegiate Aeronautical Association of America, and one of the first things that it will do is to publish a bulletin containing a complete account of the proceedings of the convention and also the constitution of the association in full. This bulletin will be sent out to every college and aero club in the country. Any college aero club now in existence which joins the association will be considered a charter member.

A very active campaign for the purpose of arousing interest in aeronautics in the various colleges has been mapped out for the coming year.

Aero Scientific Club of Washington

By Edward H. Young, President

THE Aero Scientific Club of Washington, D. C., was organized on October 12, 1909, with fifteen members, nine of whom had, or were, building aeroplanes. The club now has a membership of forty-nine, and many applications have been made recently. The headquarters of the Club are at the Y. M. C. A. Assembly Hall, where meetings are held twice a month for the purpose of discussing the many problems of aeronautics.

Last January it held a successful exhibit in conjunction with the Y. M. C. A.'s New Year reception and gave an illustrated lecture to a large audience, of which 2,500 viewed the exhibits.

On January 24-29 at the National Automobile and Aeronautic Show, members of the Club exhibited seven completed man-carrying aeroplanes, many models of original conceptions, propellers, stability devices, and general accessories.

The directors are now negotiating for a large open field for experimental purposes.

A donation has recently been made by the Club to the Junior members of the Y. M. C. A. Aero Club.

The officers are: E. H. Young, President; S. T. Bean, First Vice President; William H. Beck, Second Vice-President; F. L. Rice, Treasurer and Secretary; Herbert Oden, Historian; W. S. Kline, Official Photographer.

CLUB NOTES

Members of the Tufts College Aero Club recently made some remarkable flights with gliders on the athletic field at Tufts. Edwin P. Bugbee, of Methuen, who is president of the club, made a glide of 225 feet.

Another member, Dr. Philip Cobb, of the Chemistry Department, rose to a height of 25 feet in a towed glide, but only succeeded in staying up a very short distance.

A strong wind blowing at the time added to the excitement and also to the merit of the amateur gliders. The tow-rope of Merritt B. White's machine broke just after he left the ground; he fortunately escaped injury.

Residents of West Allis, Wis., are taking steps to organize an Aero Club in that city. Their interest in aeronautics has been aroused in particular through the fact that Dr. A. R. Silverstone is building a flyer on the fair grounds, of which he expects great things.

The ballooning season opened in New England on April 21st, when a short trip from Springfield to Hadley, say a distance of seventeen miles, was made by A. Holland Forbes, pilot, John Parker and William Hull. The greatest altitude reached was 6,500 feet.

An Aero Club has been formed in Omaha, Neb., with Col. W. A. Glassford, Commandant at Fort Omaha, at its head. The members of the Club, who rank among the wealthiest and most influential men of the State, will make a study of the science of aeronautics and encourage aerial navigation by organizing meets and exhibitions. The big Government dirigible shed will be used by members of the Club for housing their craft.

The Princeton University Aero Club has recently been formed by a number of students with a charter membership of twenty and the usual quota of officers. Arrangements are being made to hold a balloon ascension; a model contest is also under consideration.

The Aero Club of New England will, in cooperation with the Aero Club of Springfield, maintain a caretaker and balloon rigger at the latter city; he will take charge of ascensions held under the auspices of the clubs at all stations.

The Aero Club of Jacksonville, which has now forty members, will shortly apply for incorporation. Its Secretary, Mr. Davenport Kerrison, has a full-sized aeroplane in course of construction.

THE AERO SCIENTIFIC CLUB OF WASHINGTON: A GROUP.

NEW FLYERS DESCRIBED: THE FAIRCHILD MONOPLANE

By George F. Campbell Wood

THE aeroplane constructed by Walter Lowe Fairchild, of New York, and of the Aero Club of America, is remarkable in many more ways than one. That the designer and builder is an engineer and an engineer of merit—is apparent to any but the veriest tyro, on a moment's examination of his beautifully finished product.

The Fairchild monoplane is in fact a model of mechanical construction, and, if its flying capabilities are in any way commensurate with the intelligence and resourcefulness displayed in carrying out its design, those interested in the development of aviation may prepare to hail an eminently successful American monoplane.

In design this flyer is eclectic in that it embodies the most successful features of the well-known types of monoplanes.

The body or *fuselage* is of graduated steel tubing; lightness and strength have been obtained through the careful use of different sizes and thicknesses of tubes,—the strength of each part and portion having been calculated in detail.

All the tubes of the frame where especial strength has been thought advisable have been stuffed with elm, thus giving them great strength, with but little head-on resistance.

In the trussing of the frame, steel tape and cable have been used to advantage, in preference to the usual piano wire.

The wings are of the usual monoplane type, built up of fourteen double ribs over transverse one-inch steel tubes: they have flexible curved uncontrolled wing-tips, which are balanced for a certain lifting effect. The tail is similar to the flat tail of the Antoinette, which is used solely as a stabilizer and not for carrying purposes (lifting only its own weight and the framework connecting it to the main body).

Vertical and horizontal direction are obtained through rear rudders similar to the Antoinette's, except that a further vertical rudder in front of the hinge, in prolongation of the usual rear one, occupies the position of the French machine's fixed vertical fin.

Efficient lateral control is expected of an entirely novel and somewhat startling device, which will be affixed later and which the writer was requested by Mr. Fairchild not to reveal at this time.

This and the other means of control will be published in a later issue, when the machine, which is now nearing completion at Mineola, Long Island, is ready for trial.

Like the Blériot XII, the Santos-Dumont "Demoiselle," or the Grade, the Fairchild has its centre of gravity comparatively low; but, unlike them, the aviator sits above; the inventor anticipates no trouble from the usual drawback of a low centre—the tendency to oscillate—as this effect is counteracted by the stabilizing effects of the vertical surfaces in the main body and of the wide horizontal tail and by the fact that twin propellers are used for propulsion.

This use of two tractive propellers is exceptional in monoplanes, and it is interesting to note that the big screws are both to revolve in the same direction. Mr. Fairchild holds that if the gyroscopic effect of a single propeller can be deemed negligible in other monoplanes, that of two can be even more so.

The motor is a Requa-Gibson two-cylinder (disposed V shape) engine, giving 50-h. p. The propellers used are also from Requa-Gibson; their diameter is 7 feet; their pitch 6 feet; they are connected with the engine by chains running through tubes; the shafts of the propellers are 8 feet apart and 6 feet 8 inches above the ground.

The landing chassis is both exceptionally wide and exceptionally strong.

A pair of aeroplane-wheels support the fore-part of the machine when it is on the ground; the supporting columns, which, it should be noted, are double, form part of the frame; but the forks carrying the wheels are hinged to the lower ends of the tubes and the wheel-hubs are stayed independently to loose collars that ride upon a portion of the upper ends of the columns.

These collars are anchored to the lower end of the columns by a pair of powerful compression springs.

Skis, normally three inches above the ground, are used to absorb any excess of shock.

Light double skids support the tail.

The weight of this steel tube-aeroplane, unmounted, is in the neighborhood of 700 pounds: the construction is obviously of great strength for its weight.

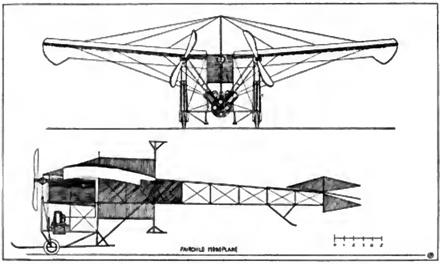
The supporting surface measures 280 square feet; the wings have a total spread of 37 feet, the length over all of the machine being also 37 feet.

Each wing measures 8 feet 4 inches in breadth at its junction to the body.

The curve of the wings is a composite one, worked out from Mr. Fairchild's calculations.

The surface of the fixed tail is 60 square feet; that of the horizontal rudder or elevator 22 square feet.

The greatest care has been embodied in the construction of this remarkable monoplane and the engineering skill of the designer is discernible in the many ingenious details used in it, some of which have never been seen elsewhere in aeronautic construction.



FLYING-MACHINE MODELS

By W. H. Phipps

THROUGH AIRCRAFT, the Junior Aero Club of America wishes to issue a Challenge to all aero clubs and aeronautical societies or associations in the United States to an aeroplane model contest.

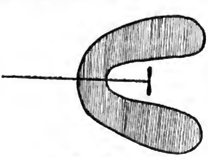
Model flying has already created such a marked enthusiasm that the time has been thought ripe by the J. A. C. A. to widen the scope of the sport during the coming summer by sending out this general challenge.

The contests will not be limited to the younger generation, for the latter is well able to hold its own against grown-ups—as the results of all the recent contests only too clearly prove. In contests where no age limit prevails all the honors have gone to the younger participators, but in order to avoid any unpleasant comments about including "growns" and "ungrowns" in the same competitions, it has been decided to offer two identical cups, one for the men and one for the boys.

A challenge cup goes to the club whose member has obtained the longest flight from his model, of all competitors. This cup is donated by Edward Durant, whose father, it will be remembered, was the first American aeronaut, and who is himself the director of the Junior Aero Club.

The contests are to be held under the rules of the National Model Aero Club, which were published in the last number of AIRCRAFT. The contestants will then be able to compete at the same time for the fine "1910 Cup," the picture of which was also published last month in this magazine, and which, it will be recalled, was donated by no other than A. Leo Stevens, the celebrated aeronaut. Its winner will be the individual, regardless of age or sex, whose model flies the greatest distance, under official observation, during the present year.

It might here be said that the indications are numerous that girls and women will soon be rivalling in enthusiasm their male relatives in model flying, and that this will be the signal for a boom in the sport which will rival any fashionable game or fad of the past few years.


LESH MODEL

The regular model contests held by the West Side branch of the New York Y. M. C. A. were continued on March 26th at the Twenty-second Regiment Armory.

The winners in the men's class were: W. M. Sage, with a Curtiss model, which flew a distance of 107 feet 6 inches, starting from the ground. In the boys' class the winners were F. M. Watkins, 168 feet, first; D. Grier, 139 feet, second, and C. G. Vogel, 132 feet, third.

Another Y. M. C. A. contest took place in the Fourteenth Regiment Armory, Brooklyn. There were twenty machines entered. W. M. Sage and F. M. Watkins repeated their victories with 106 feet and 167 feet, respectively; C. G. Vogel was second to Watkins in the boys' class, with 132 feet 5 inches.

Model contests were held in the Metropolitan Opera House on April 18th, under the auspices of the French Benevolent Society. The big event of the evening was the "Cross-Channel" contest, the "Channel" being the space between the balconies; a large silver cup was offered for this contest by M. Henri Chapal; it was won by L. J. Lesh, W. H. Phipps being second. The Reims contest was likewise won by L. J. Lesh, with the same machine which had carried off the first event.

Much credit is due Dr. Dederer for the splendid way in which these contests were conducted.

Model competition added interest to the annual games of Public School 77, held on April 9th, at the Eighth Regiment Armory, New York. Both the Junior Aero Club and the School contributed their quota of contestants. F. M. Watkins once again proved the victor in the boys' class, with a flight of 145 feet. His model is a monoplane of the front rudder type, driven by two propellers at the rear. H. Southworth was second, with 139 feet; a flight of 124 feet gave third place to P. W. Pierce, a picture of whose machine appears on the next page.

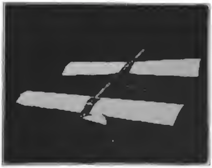
In the men's class the models were required to start from the floor; in spite of this handicap

W. S. Howell, Jr.'s entry flew 149 feet. The other contestants were: R. S. Barnaby, C. G. Halpine, William Pieller, J. Caust, H. E. Ragot, J. Basline, G. Merz, J. Silberman and A. Hexamer.

One of the features of the outdoor games of Public School 87, Manhattan, Seventy-seventh street and Amsterdam avenue, which will be held at Pastime Oval the afternoon of May 28th, will be an aeroplane contest for elementary schoolboys.

The date fixed for the model and kite contests to be held by the International School of Aeronautics, Garden City, Long Island, N. Y., has been changed to June 11th and 12th, because of the impossibility of Professor Lawrence Rotch being present on May 15th, on which date he is due in Pittsfield to take part in some aerostatic experiments.

On this occasion a cup, offered by Mr. Campbell Wood, will go to the owner of the model making the longest flight in point of time, regardless of the distance covered or of the point of landing.



MODEL OF P. W. PIERCE.

BIG MODEL CONTEST IN FRANCE.

The records made by flying models in the recent contests for the "Gordon Bennett Cup" for models, in Paris, show that the American-built models fly further than those constructed abroad. The longest model flight made during the Paris contest was that of M. Dieterin's machine, it flew 156 feet 4 inches. His model was called "Chantecler," owing to the feathers of which the planes were made; these were attached onto a light framework suggestive of an Antoinette monoplane.

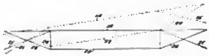
There were twenty-six prizes, the principal ones being the Prix Paulhan, 150 francs in cash, given by the famous aviator. Other prizes were the Prix Avia, goods to the value of 500 francs; the Prix de "L'Auto," a gold medal; the Prix Henri Rougier, 100 francs cash; the Prix Bleriot, 100 francs cash; the Prix Henry Farman and the Prix Latham.

It is to be hoped that just such interest in model-flying can be aroused in this country and prizes like the above allotted to the winners.

RECENT PATENTED INVENTIONS

Briefed by Gustave R. Thompson

U. S. PATENT 953,810, April 5, 1910. Edward J. Augsberger. This is an aeroplane claiming automatic stability, through auxiliary planes disposed at the ends of the main planes. When one side is depressed the auxiliary planes on that side oppose a greater resistance to the air than those on the other, thereby tending to lift that end.

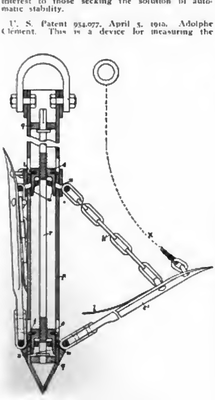


U. S. PATENT 953,810.

The intricacy of the mechanical side of this invention precludes a regular description, but the above indication and annexed sketch will give an idea of the patent, which is illustrated by no less than nine figures. It should be of interest to those seeking the solution of automatic stability.

U. S. Patent 954,077, April 5, 1910. Adolphe Clément. This is a device for measuring the thrust or efficiency of propellers. The propeller is attached to a shaft coupled to but capable of longitudinal movement on a second shaft.

The first shaft is also connected, by a rod running through the second shaft (which is tubular), to a dynamometer; it is set in rotation through the second shaft and the thrust of the propeller, transmitted through the connecting rod, is measured on the dynamometer.

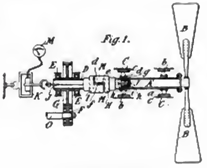


U. S. PATENT 954,510.

U. S. Patent 954,510, April 12, 1910. Heinrich Fuchs. An anchor for airships which is driven into the ground and is prevented from being dragged by the spreading of the arms visible in the figure.

To withdraw the anchor the arms are detached from the centre piece, both arms and centre piece being pulled up separately by the cords attached to each piece.

One of the patents mentioned here last month also related to an airship anchor, and it is apparent that much thought is being given to the problem of anchoring big dirigibles, especially in Germany.



U. S. PATENT 954,077.

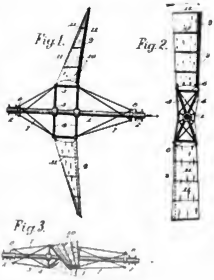
It is obvious that the possibility of anchoring or tethering airships in the open is the most serious problem to be faced in connection with them; this has been shown many times, but never more forcibly than last month, when the "Zeppelin II" broke her moorings and was wrecked in consequence.

U. S. Patent 954,092, April 12, 1910. August von Parseval. This is the latest non-rigid propeller devised by the celebrated dirigible builder.

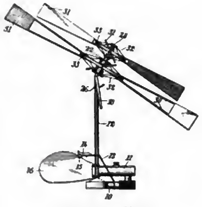
In propellers of this kind it is necessary to weight the propeller to obtain the proper centrifugal force to spread out the blades. Weighting the ends of the propellers has been found objectionable and the present invention proposes to overcome these objections by distributing the weight over the blades. Metallic chains or ropes are therefore run through the front edges of the blades (the latter being made preferably of canvas); the transverse stiffeners are also formed of chains or cables.

U. S. Patent 955,049, April 12, 1910. Gustave H. Brekke. A helicopter: The two horizontal propellers revolve, of course, in opposite directions to obviate a rotation of the machine, they can be tilted—as shown in the figure—to give a forward motion, by means of the lever seen just under the lower propeller.

Steering is by a rudder attached beneath the aviator's seat.



U. S. PATENT 954,092.



U. S. PATENT 955,049.

NEWS IN GENERAL

By Mrs. J. Herbert Sinclair

THE Indianapolis Motor Speedway is claimed with some show of reason to be the greatest race course in the world.

Aeronautic contests will form a large share of those to be held there this summer, and will culminate in the National Championship Balloon Race on September 17.

Arrangements have been made between the Motor Speedway Company and the Aeroplane Exhibition Company for the big Aviation Meet to take place during the week beginning June 13th.

The Wright brothers have given their consent to this being an open meet in accordance with the Wright Company-Aero Club of America agreement (published elsewhere in this issue); it will be the first aviation meet held under this license.

Thus an open field is left to all aviators flying any type of machine.

An entrance fee of $100 for each machine pays for entry in all events.

The Wrights have five or six machines entered; these will be driven by the most efficient of their pupils now receiving instruction in Alabama, under Orville Wright—while at the same time especial efforts are being made to have the two famous brothers themselves make exhibition flights.

There will in all probability be additional events for dirigible balloons.

The following events form part of the promised programme:

Event No. 1—For the machine starting with the shortest running distance.

Event No. 2—For the start from the shortest distance regardless of method for rising in the air.

Event No. 3—For the machine making a complete circuit of the Speedway Track nearest to the ground.

Event No. 4—For the machine making the fastest lap of the Speedway regardless of height.

Event No. 5—For the machine making the fastest ten miles.

Event No. 6—For the machine landing nearest a given spot. Machine must land within a given area to receive a prize.

Event No. 7—For the machine making the slowest lap of the course in the air.

Event No. 8—For the machine remaining in flight for the longest time (duration prize).

Events No. 9 to 15—Special match races between various contestants.

Events Nos. 15 to 20—Special open events between the various aeroplanes.

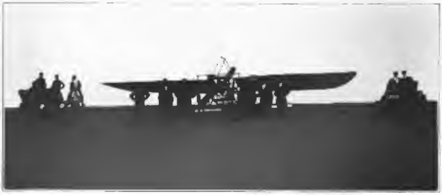
Events Nos. 20 to 25—Handicap events around complete circuits of the course at various distances.

Events Nos. 25 to 30—Carrying various numbers of passengers at fast and slow speeds, near the ground or at high altitudes.

Saturday, June 18th, last day of Aviation Meet—Special trials for record high flights. Also cross-country flights over the State of Indiana.

In all these events there will be special cash prizes, trophies and medals, with additional bonuses for lowering existing world's records.

It is said that the cost of the meet will be $95,000. The managers are guaranteeing money prizes to the amount of $[illegible], and $[illegible] cash to the Wright brothers. They promise to spend an additional $20,000 in promoting the meet.



THE NEW BEACH BLÉRIOT-TYPE MONOPLANE

The above illustration shows a front view of the new Blériot-type monoplane which has been constructed lately by Mr. Stanley Y. Beach, the president of the Scientific Aeroplane Company, and with which he has been experimenting of late at Stratford, Conn. The photograph which we reproduce was taken on April 23d, just before the machine got off the ground in its initial flight. In place of the 3-cylinder 4-cycle Anzani motor used by Blériot, Mr. Beach has employed a 4-cycle air-cooled motor of the same power (25-h. p.). With a 6-foot propeller, mounted upon the motor crankshaft, a thrust of over 200 pounds is obtained, which is sufficient to get the machine in the air with ease under favorable conditions. This new monoplane has a spread of 30 feet and a fore-and-aft length of 25 feet. Its surface is 224 square feet and its weight, complete, 500 pounds.

The chief feature of this new monoplane is its gyroscopic stability device for maintaining its transverse equilibrium (shown in the photograph on the next page). This apparatus is driven by the motor and exerts a powerful force to keep the machine always on a level keel. According to Mr. Beach, the experiments which have been made with it have demonstrated that this device will do all that is claimed for it, in which case it is a stride in advance in the making of aeroplanes practical for every-day use. The instrument can be applied to any type of aeroplane, and the Company will build any type the purchaser may desire. At present, however, but two types of monoplanes similar to the Blériot Cross-Channel and the Antoinette types are being manufactured.

An improvement on aeroplane wheels is claimed by Mr. J. A. Weaver, Jr., of New York. He makes a wheel with a particularly wide hub which he avers gives it much greater strength, thereby making it possible to use a lighter wheel than otherwise.

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CHASSIS OF BEACH MONOPLANE, SHOWING GYROSCOPE IN PLACE.

William F. Assmann, St. Louis, made a thrilling landing by night with his balloon "Missouri" recently. To land in a high wind on a dark night is a feat the difficulty of which can only be appreciated by an aeronaut. Mr. Assmann came through the ordeal with much credit.

At the Portola Celebration at San Francisco, one of the most interesting sights was the simultaneous start of the big spherical balloons, "Queen of the Pacific" and "City of Oakland." In the former, piloted by Captain I. Baldwin, of the San Francisco Aero Club, Miss Shaffer was a passenger, while Miss Woller, of Oakland, was one of those in the basket of the "City of Oakland."

The Sacramento Aero Club, of Sacramento, Cal., has been organized with a capital of $15,000 by Tracy A. Miller, E. Roy Drake, G. H. Seaman and A. D. Bevan.

A prize of $2,000 has been offered by Andrew Carnegie to the first pupil of the Carnegie Schools of Technology to produce a heavier-than-air machine which will fly.

Captain C. de F. Chandler has been once more assigned to the duty of superintending aeronautical experiments at Fort Omaha, Neb.

The C. E. Conover Company reports a most successful month. Among those using their Naiad aeronautical cloth are such well-known men as Curtiss, Willard, Herring, Dr Greene and C. & A. Wittemann.

Mr. Hugo C. Gibson informed one of the **Aircraft** staff the other day that he was finding a proper appreciation on the part of the American public for the class of propellers turned out by the Requa-Gibson Company, which is doing a large business in this line. It looks as if the New World were at last beginning to wake up to certain possibilities which our friends on the other side of the Atlantic perceived quite a little while ago,—such as the production of propellers in quantities and interchangeable, as compared with the "jack-knife" method.

Among the many inventors seeking to solve the problem of "direct" lift is Joseph E. Bossell, of Pittsburg, Pa.

A combined helicopter-parachute-gyroscope-flywheel monoplane is what Mr. Bossell calls his machine, and if it in any way comes up to the expectations of the inventor, it will certainly prove a stupendous advance upon anything produced to date.

Mr. James E. Plew, vice-president of the Aero Club of Illinois, is building a power flying machine on the principle of the Montgomery glider (which, it has been claimed, possessed absolute inherent stability). The machine is of very light construction. It is to be operated by a 12 horse power opposed-cylinder engine, the cylinders being 3⅝ x 3⅝ inches. Mr. Victor Lougheed, author of "Vehicles of the Air," is collaborating with Mr. Plew in the construction of this machine; he is responsible for the engineering work and is superintending its construction. They expected to have it ready to fly about May 15th.

The new Herring-Burgess biplane has recently been making some good flights at Plum Island, Mass. Mr. Burgess, A. M. Herring and Greeley S. Curtis flew in turn. The latter sustained a fall when trying his hand at a turn, but sustained no injury.

Mr. Octave Chanute is leaving for Europe on May 17th, to remain three months.

Among the best flights made by Glenn Curtiss and Charles Hamilton at the San Antonio meet were one of 500 feet in altitude by Curtiss, with a passenger, and another in which Hamilton reached 900 feet.

At Atlanta Hamilton again distinguished himself with his swift Curtiss. He beat out an automobile in a match race.

It would seem, however, that, at this time, the prevailing wind would have much to do with deciding the victor in such a contest.

Kansas City is planning to hold a big aviation meet. The local Aero Club has contracted with K. L. Bernard of New York, who is business manager for Curtiss, Hamilton, Mars, Benoist, Harlan and Captain Baldwin for the appearance of these well-known sky-pilots at the meet. It is also said to be negotiating with some foreign flyers. The meet is to take place from June 30th to July 4th.

Hamilton has been invited by President Diaz to make flights in Mexico.

The records recently made at Memphis will stand as official, the meet having been made under the auspices of the Aero Club of America. Curtiss's time of 5 4-5 seconds in the quick-starting competition will take some beating.

The Ohio Valley Industrial Exposition, to be held August 29th to September 24th, will make a special feature of aeronautical exhibits.

The Western Aeroplane Company has been organized with a capital of $20,000. The directors are Harvey Bissell, Tod Ford, Jr., of Pasadena, and John J. Slavin, of Los Angeles.

The Nasrs Aerial Navigation Company, of Toledo, Ohio, have removed their headquarters to South Bend, Ind.

The Cleveland Aeroplane Company has been incorporated by Sterling Parks, Edward F. Spurney, R. S. Liader, W. J. Brinker and Josephine Merrick. It is capitalized at $10,000.

Aircraft has again had to postpone the continuation of S. P. Langley's "Internal Work of the Wind," owing to the receipt of several articles on questions of the hour. Several other excellent articles available were also crowded out of this number, notably a particularly interesting one on "Kites," by Edward H. Young.

NOTICE

The price of AIRCRAFT has been increased from ten cents a copy to fifteen cents. The aeronautical movement is assuming such remarkable proportions that it was felt it could not be adequately presented to our readers in the style and manner which they are entitled to expect of this magazine, at the lower rate.

The yearly subscription naturally becomes one dollar and fifty cents, but with a view of not taking unawares those who were contemplating subscribing, we will for the present accept the sum of one dollar in payment of a yearly subscription.

Owing to the unexpectedly large demand for back numbers of AIRCRAFT, these are now very scarce; they can be obtained at the following prices:

March	30 cents
April	65 cents
May	25 cents

Until these back numbers are virtually exhausted, however, we will make a point of starting any subscriptions received from the month desired.

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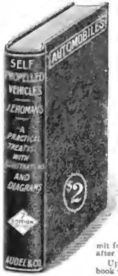

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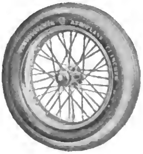

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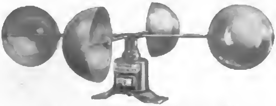

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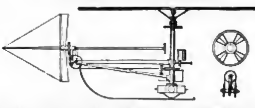

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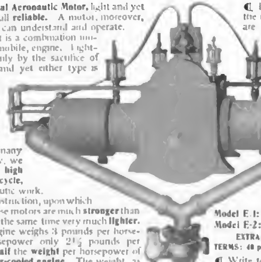

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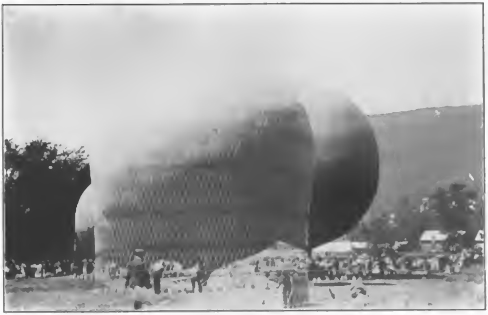

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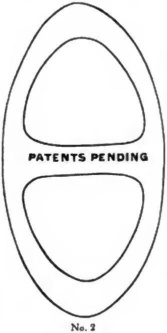

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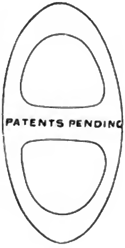

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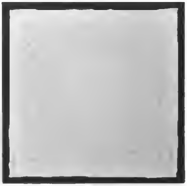

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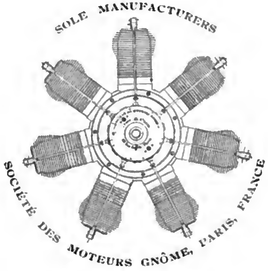
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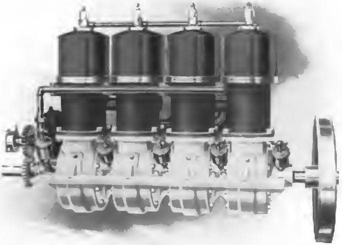

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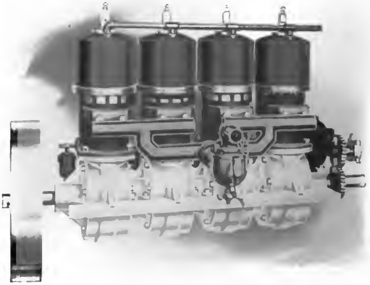

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AIRCRAFT

Vol. I. No. 5. NEW YORK, JULY, 1910. 15 CENTS A COPY. $1.50 A YEAR.

ALBANY—NEW YORK

By Glenn H. Curtiss

THERE were, of course, but two things which could have prevented the Albany-New York flight: the breaking of some vital part of the aeroplane and bad weather.

I took pretty good care that I should not fall victim of the first of these two contingencies: I had my latest and best engine aboard and, just as I had every reason to expect, it ran perfectly from start to finish. Extra precautions were taken to prevent the loosening of guy wires and, in fact, a leakage in the oil tank was the single mechanical incident of the voyage. While the running out of oil compelled me to land twelve or thirteen miles before reaching Governor's Island, it was only afterwards that I discovered it, for I thought at the time that the loss of the oil was due to the pump causing too great a flow.

As regards the weather, it was all that could be desired; the air disturbances I encountered in the narrow part of the Hudson Valley—violent as they proved to be and ticklish as they were to overcome—were purely local in character, and in the open stretches the breeze was never very great.

I waited several days for a good day, as I knew a breeze at Albany would mean a small gale around such places as Storm King; had the course lain over perfectly flat country, I would not have been so hard to please in the matter of air conditions.

I have been asked whether this flight was a harder one to succeed in than the London to Manchester one. It is very hard to compare two events so different in character.

Of course, Paulhan went further than I, and I went faster than Paulhan, but when it comes to comparing the difficulties of two such flights, only one who had attempted both of them could really pronounce himself. A water surface having, of necessity, but one level, "flying over water," may sound easier than "flying over land," but when the water becomes a narrow strip between precipitous shores, a rolling country would seem far preferable as an underlying surface to the air one is flying in.

The general weather conditions, from all accounts, were not as good in the Manchester flight as in the Hudson one, but on the other hand, the English flight was not made on a single date, and both Paulhan and Grahame-White had six or seven hours' sleep between the first leg of the journey and the second.

I see no reason why I couldn't have flown to New York without a stop: my machine could have carried the extra gasoline, and the engine was cool and in fine running order on landing near Camelot, just south of Poughkeepsie.

It is practically impossible to say precisely at what speed I traveled, as it would be necessary to lay out the exact course over the ground taken by me, together with my changes of level, but it was about fifty-three miles an hour.

The first part of the flight—about seventy-four miles—took just eighty-four minutes; I have before made a flight about as long as this, when I flew eighty-five minutes and five seconds, going around and around the course at Los Angeles, on January 20th last; I used a different machine at that time (my Gordon-Bennett Cup racer), and because of the distance lost on the turns, covered only 53 miles and a fraction officially in that time.

After I had negotiated the narrow reaches in the Highlands south of Poughkeepsie, I felt pretty sure of success, but the Metropolitan Tower certainly looked good to me when I first caught a glimpse of it far to the south, when soaring over the Tappan Zee.

G. H. Curtiss.

CHRONOGRAPHIC ACCOUNT OF FLIGHT

By Augustus Post

Official Representative of the Aero Club of America and Timekeeper

7.02 A.M. Curtiss started from Van Rensselaer Island, Albany.
Mr. Jacob L. Ten Eyck official starter for Aero Club of America.
7.03 Passed over the city limits of Albany.
7.20 New Baltimore.
7.26 20 miles. "Times" special train caught up with aeroplane.
7.27 Milton Hook Brick Yards. Wind still. Aeroplane flying about 50 miles per hour. Passed lighthouse on West side of Hudson river.
7.32 Stockport, 24 miles.
7.35 Hudson, 29 miles. Aeroplane flying high. Catskill Mountain House could be seen in the distance. Machine flying steady, water calm, small ripples along the surface.
7.36 30 miles. Train passed through tunnel parallel with 'plane.
7.40½ Tower No. 81, N. Y. C. R. R., Greendale ferry.
7.41 A.M. Catskill on West shore of Hudson river. Flying high.
7.44½ Water trough in center of track. Train equal with 'plane.
Linlithgo station.
7.46 Germantown steamer duck. Aeroplane flying well.
7.48 Passed old steamboat on West side of the river. Germantown station. Aeroplane pitched when foot oil-pump was used. Slight ripples on the water.
7.51 Train running parallel with aeroplane.
7.53 Tivoli. 45 miles. Aeroplane high. Wind slightly from the West.
7.58 Barrytown. 49 miles. Aeroplane about 800 feet high, descending a little lower until about 400 feet high.
8.03 Kingston. Brick yards on West shore of river. Curtiss is flying very near the train, within perhaps 100 yards.
8.04 A.M. Aeroplane turns toward West. Heads a little more into the wind and crosses to the West side of the river at high speed.
8.05 Private yacht dock on East side of river. Aeroplane flying high again.
8.06 Rhinecliff ferry. 54 miles. Aeroplane has been flying 1 hour 4 minutes. Seems to be flying well.
8.08 Passing tower, No. 67, N. Y. C. R. R.
8.08½ Train passed through tunnel. Curtiss goes back to West side of river: flying over ice-houses.
8.11 Passed lighthouse in middle of river. The aeroplane seems to be slowly rising and falling on the varying currents of air. River is very wide at this point. There are large stone crushers on the West shore, and a large stone building of a Catholic institution on the bank of the river.
Staatsburg. 60 miles.

8.16 A.M. Aeroplane is now passing over a large white house, some private residence on the West shore of the river. Aeroplane is flying past freight train on the West Shore Railway.

8.18 Hyde Park station. 64 miles. Train passing water trough in center of railway track. Passing Insane Asylum at Poughkeepsie.

8.20 Passing upper portion of Poughkeepsie. 'Plane over river.

8.23 Passing Poughkeepsie bridge. Aeroplane about 200 feet above it.

8.25 Train goes through Poughkeepsie station.

8.30 Train arrives Gill's Mill dock, opposite landing place of Curtiss. Aeroplane landed according to Curtiss's watch on his machine at 8.36. I left special train and went to the field where Curtiss had landed, arriving a few minutes later. The tanks of the machine were filled with 8 gallons of gasoline and 1 gallon and a half of oil. The machine was carefully examined and found to be in good order, one wire being stayed to prevent vibration. Mr. George Collingwood took special train party to New Hamburg station.

9.26 Curtiss started for New York from field in property of Mr. Gill.

9.31 Camelot.

10.02 West Point. Aeroplane passed over Constitution Island at an altitude of about 400 feet above the land.

10.06 Manitou.

10.14 Peekskill.

10.15 Ossining. Aeroplane flying on West side of the river.

10.25 Dobb's Ferry.

10.30 Yonkers. Aeroplane flying about level with top of Palisades.

10.35 Landed 214th Street, Inwood. After passing down river to Dyckman Street, returning to Spuyten Duyvil and passing over drawbridge the aeroplane landed upon the property of the Isham estate.

CURTISS LANDING AT GOVERNOR'S ISLAND, NOON, MAY 29TH, 1910

11.42 A.M. Curtiss left his landing place. Flying again over the drawbridge, but over the Hudson river, he turned South, passed New York City, and landed

12 M. at Governor's Island at noon.

Curtiss also entered for the Scientific American trophy, and the first flight from Albany to the landing place at Poughkeepsie—74½ miles—will count as a record for this event, and if not exceeded during the year will stand at his trial for this trophy.

Augustus Post

FLYING AT MINEOLA

By Mrs. J. Herbert Sinclair

THE BALDWIN BIPLANE IN FLIGHT: CAPTAIN BALDWIN AT THE WHEEL

"An American Mourmelon," was the way a well-known enthusiast put it, on viewing the rapidly increasing activity displayed at Mineola, by aviators and would-be aviators now assembled there to the number of a score or more.

The flying grounds have become the rendezvous of all the aeronautic enthusiastics of the metropolis, and a "but de promenade" for the fashionable colonies in the neighborhood.

Hardly a day passes now that several of the flyers are not seen in action above the adjacent Hempstead Plains, whilst an examination of the low-lying buildings springing up between Mineola and Garden City, will reveal big artificial birds within, in every conceivable state of completion, some mere skeletons of what they are to be, whilst others are receiving the finishing touches before being taken out to conquer the element for which they are destined, and to the problem of the mastery of which, their designers have devoted weeks of thought and labor.

Between Mineola and Garden City are the grounds of the Aero Club of America; three machines are quartered there and others are expected.

In the south shed is Clifford B. Harmon's Henry Farman biplane, the self same machine which carried Louis Paulhan to a world's height record at Los Angeles, last January.

Almost every evening, after business hours, the millionaire clubman, who sees in aviation a science, a military art and a sport, in which his country should be preëminent, motors out to Mineola to make a flight or two; his French mechanics trundle the historic machine out of the shed, set its ever-willing Gnôme engine awhirl, and a moment later it is winging its way over the plain, only to alight at the will of its driver.

Mr. Harmon invited his friends to witness his attempt to earn the Aero Club's aviator's pilot license, a few weeks ago; he was entirely successful in this making the three flights of five kilometers each without trouble, and being the

JOE SEYMOUR IN HIS HERRING-CURTISS BIPLANE

CLIFFORD B. HARMON, IN HIS HENRY FARMAN BIPLANE, QUALIFYING AS AN AVIATION PILOT OF THE AERO CLUB OF AMERICA, ON MAY 21ST. THE BALDWIN BIPLANE ON THE GROUND, TO THE RIGHT

first amateur to achieve the distinction in this country.

Walter Lowe Fairchild's steel-tube monoplane, occupies the north shed; it is fitted with an engine and propellers from Requa-Gibson, and is, at this writing, ready for preliminary trials.

This interesting machine was described in the June AIRCRAFT.

Captain Thomas A. Baldwin's biplane, which is referred to in detail elsewhere in this issue, occupies a tent to the rear of Mr. Fairchild's, whilst further back still is the large shed in which Mr. Harkness' Antoinette monoplanes are to be housed: these flyers are similar to the bird-like machines which Latham, Burgeat, Wachter, Kuller, de Mumm, Wiencziers, Labouchère, the late Hauvette-Michelin and Hayden Sands have made famous in Europe and in Egypt; none has ever flown in this country.

A quarter of a mile to the west is the large shed or hangar of the Aeronautical Society; notwithstanding its generous proportions its floor space is completely rented to members, and those not fortunate in applying early enough for space whereon to put their machines together and keep them between trials, have to resort to subsidiary tents in the immediate vicinity of the main building.

There are few hours of the day when this great aviary is not a scene of earnest activity: "Joe" Seymour, the well-known racing motor-driver, has his Herring-Curtiss biplane quartered here. This is one of the first of these famous flyers turned out; it originally belonged to Mr. Warner of Beloit, Wis., who has made many flights in it. Seymour has been learning to fly during the past few weeks, and has now entirely mastered the art; notwithstanding his weight—over 200 pounds—and the relatively low power of his machine, he has made fine flights over the plains and promises to be as proficient at the wheel of his air-craft as at that of his racing car.

Three other biplanes and two monoplanes are nearing completion in the big hangar: the huge Diefenbach biplane immediately arrests attention upon entering the shed; outside of the Cody biplane, Prince Bolotoff's triplane and the Piggott biplane it is probably the largest aeroplane yet built; it is designed to carry passengers and shows much strength in its design.

Right next to it stands the biplane of Miss Lillian Todd, a lady who has for some time been interested in the science; the machine embodies many promising features, and some improvements over the design of last year's model. The undulating frontal curvature of the upper plane among other things is a novel feature in this country, and the first trials of the biplane are eagerly awaited.

The biplane of Frank Van Anden is another which will soon be in the air. Mr. Van Anden has already flown in a machine of his construction, and anticipates making long flights in his latest conception.

Paul de Kilduchevsky and L. Rosenbaum are working hard on the construction of their monoplanes.

The former avers he will fit a large hundred and twenty horse power motor to his machine before long, and will soon be ready to take to the air, whilst the latter is still farther advanced on his racy-looking flyer, which is original in design in many respects, notably in having his surface in a single undivided plane.

The most famous machine in the shed is, of course, that on which Glenn H. Curtiss made history last year, when, at its helm, he won the Gordon-Bennett Cup, at Reims, on August 28th.

It is now the property of Charles Hamilton, probably the greatest aeroplane driver in the world at this time, and almost certainly the most daring. Hamilton's flights at Mineola enabled New Yorkers to get a glimpse of the sensational aerial rough-riding and caper-cutting in which he has indulged almost daily, from the Atlantic to the Pacific, in the many exhibitions and contests of the last six months.

His famous "dips" where the biplane is made to plunge headlong toward the earth, in a straight or spiral course, and with or without the motor running, constitute "thrillers" of no mean order. His machine plainly showed the wear and tear of his hard campaigning, but although somewhat out of shape and in need of repair, it reveals strength in the essential parts—those on which the life of the man at the wheel depends.

As this is written, the great little biplane is being taken in hand, and put into condition to undertake the New York to Philadelphia flight.

Outside the Aeronautical Society shed, and housed in a tent, is the beautifully built little Curtiss-type biplane of Edwards and Edick; it is fitted with what looks like a most promising 22-25-h.p. motor.

Other machines in the neighborhood are that of F. Raiche, being assembled in a building in Mineola village, and that of Mr. F. W. Wilcox who recently graduated from Columbia University with the degree of Aeronautical Mechanical Engineer,—the first time it has been conferred.

The Wilcox machine is ready to fly; it is housed in the shed of Albert Triaca, situated in the grounds of his International School of Aeronautics, at Garden City.

This biplane is a remarkably finished product of the Henry Farman type, but with some important distinctions: for one thing the whole tail or rear cell acts as a biplane elevator instead of merely a hinged portion of it doing so. The control is also different, for an ingenious device, of which we may have more to say later, causes the aileron of one side to assume a negative angle, and oppose a pressure precisely equal to that opposed by the aileron turned down, thus bringing about no turning movement; this makes a rudder obviously unnecessary in straightaway flight, and to judge from the latest legal decisions, this would mean the Wright patent-rights are not infringed on by this machine.

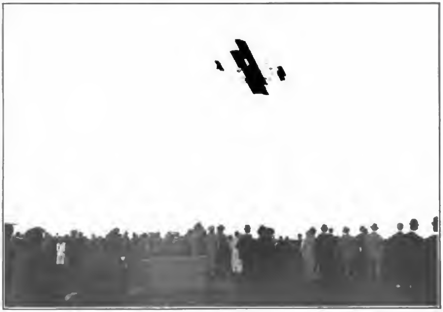
The Wilcox biplane is to be driven by Lewis Strang, who, like "Joe" Seymour, has a national and even international reputation as an automobile race-driver.

Like in Europe, where nearly all the famous professionals of the road—among others, Fournier, the Farman brothers, de Caters, Rolls, Cagno, Duray, Rougier, Wagner, Hanriot, Rigal, Bablot, Edmond, Hautvast, Christiaens and poor Le Blon—naturally took to professional flying when road racing died out, the crack motor drivers of America have begun to look skyward.

AT THE AERO SHOW

At a recent show the favorite question with the uninitiated seemed to be, "What happens when your engine stops right up in the air?" the impression being that the machine would drop like a stone. One exasperated exhibitor, after being asked the question for the nth time, replied: "Oh! You simply telephone to the works for another."

Another brilliant suggestion by a visitor was that the gills on air-cooled diagonal engines should be cast horizontally "so as to give some extra lift."



CHARLES K. HAMILTON MAKING ONE OF HIS FAMOUS DIVES, IN HIS EIGHT-CYLINDER HERRING-CURTISS RACING BIPLANE

EDITORIAL

AFTER RECORDING month after month the great feats being performed in Europe, it is certainly no small satisfaction to point to an American's performance over American territory on an American machine, fitted with an American propeller, driven by an American engine, as the greatest aeronautic achievement of the month.

In changing the conditions under which its Albany-New York prize could be won, there can be no question that "The New York World" acted most wisely. It seems very probable that both the carrying capacity of Curtiss's biplane and the endurance of the famous aviator would have been equal to the more stringent effort of making a "non-stop run" but with the greatly increased chances of failure which the stricter conditions would have entailed, it is doubtful if the attempt would have been made at this date.

Glenn Curtiss once more showed of what stuff he was made, in this historical flight, and demonstrated his remarkable capability to undertake a great task and carry it through to a successful conclusion.

His magnificent success on May 29 is a fitting sequel to his astounding European campaign of last year, when, with a new and untried biplane, he swept all before him and captured the Blue Ribbon of aviation from the most famous bird-men of the Old World.

As a direct result of the winning of "The World's" prize, tens of thousands of dollars are being offered all over the country for cross-country flights, notably $30,000 for a flight from New York to St. Louis by "The New York World" and "The St. Louis Despatch," $25,000 for one between Chicago and New York by "The New York Times" and "The Chicago Evening Post," $5,000 for one from Indianapolis to Chicago, and $10,000 for one from Washington to New York.

As this issue is going to press, Charles Hamilton, who is perhaps the most expert aeroplane driver in the world to-day and is certainly the most daring, is about to undertake a flight from New York to Philadelphia and back for a prize offered by "The New York Times."

o o o

Because many of the events indicating the progress of Aeronautics are at present occurring in other countries than the United States, this publication is making a special feature of its Foreign News.

Every periodical on the art of which we have any cognizance is received in these offices, whether it be the "Motor" of Sydney, N. S. W., or the "Vosdookhoplavatel" of St. Petersburg, the "Locomocion Aerea" of Barcelona or the "Luftschiffer-Zeitung" of Vienna, "L'Aéro-Mécanique" of Brussels, or the great European sporting ***daily*** newspapers.

One and all are perused by European members of our staff, familiar with the language they are printed in and with conditions, places and people abroad, and competent to judge relative values in aeronautic news.

Besides these, our special correspondents in every aeronautic center of importance the world over furnish us with regular correspondence on all doings of interest in their vicinity, and letters are exchanged with the leading foreign aeronautical publications, the better known of which are "The Aero" and "Flight," of London; "L'Aérophile" and the "Revue de l'Aviation," of Paris; the "Zeitschrift für Luftschiffart," of Berlin; "L'Aviatore Italiano," of Milan, etc.

It is in this manner that we have been able to furnish our readers, in the first five months of our existence, with accurate and definite news from ***over forty*** different countries and colonies.

Our Foreign News aims at representing the essence—the condensed summary—of the previous month's aeronautical doings, all over the world, and at showing the steady spread of the movement to the far corners of the earth. They are also calculated to make those still wondering "whether there is anything in it," reach the opinion to which they must inevitably come, at an earlier date than otherwise.

Perhaps it is because this need is not so much felt by our foreign contemporaries of note, but, whatever may be the reason, we find that, in the gathering and publishing under one head of these items of news from such widely dispersed localities, Aircraft has already assumed the internationally preeminent position which we aspire to gain and maintain in every branch and phase of the Art and the movement, and in the presenting of it to our readers.

LAW AND THE AIR

By Denys P. Myers

Continued from June AIRCRAFT.

AIR-NAVIGATORS IN WAR

A TRANSITION from peace to war is a sharp one in the life of a nation and, plunging the peoples concerned into a crisis, necessitates quick and definite action in all cases. War is the abnormal status, and actions of little consequence in themselves may then be fraught with the utmost importance. Therefore a great deal of attention has been paid to codifying the laws of war in an effort to reach the end that every situation to be encountered can be solved by a specific rule.

No one is keener about tackling the novel problems involved by new inventions than the government legal expert charged with keeping the rules of war up to date. Yet man's ingenuity has outdistanced his ilk. The régime of the air is an actuality, and he is in the lurch, and will probably remain there until the Third Hague Conference of 1915 shall enable him to catch up with the times.

Of the fourteen conventions drawn up by the Second Hague Conference in 1907, eleven related directly to a state of war, settling many mooted points both as to persons and property. In some of those conventions regulations were agreed to for the first time as to wireless telegraphy in war, although the scientific fact was several years old. It will be likewise, in all probability, several years before any adequate rules as to the conduct of aerial hostilities will exist. Yet at no point where aeronautics and law touch is the necessity for definite regulations so great.

The warrior in the air is a fighter of the third dimension, whereas his brother on the earth moves in but two dimensions. He is not bound by the ordinary rules of motion that circumscribe the activity of the soldier of the line. There has been much discussion and considerable disagreement about the ability of an aviator to inflict damage by dropping bombs, but the few experiments conducted in this country at Los Angeles and San Antonio, Tex., so far as their results are known, would indicate that the bomb and the man-bird are not altogether a useless combination for warlike operations.

No one denies, however, the great advantage of the vehicles of the air for purposes of espionage. Here is a delightful incongruity: Art. XXIX of the regulations on land warfare of The Hague, 1907, says:

> "A person can only be considered a spy when, acting clandestinely or on false pretenses, he obtains or endeavors to obtain information in the zone of operations of a belligerent, with the intention of communicating it to the hostile party. . . . The following are not considered spies: Soldiers and civilians, carrying out their mission openly, intrusted with the delivery of despatches intended for their own army or for the enemy's army. To this class belong likewise persons sent in balloons for the purpose of carrying despatches and, generally, of maintaining communications between the different parts of an army or a territory."

Such a provision would scarcely be made to-day—three years later—, for it virtually exempts the aeronaut from the opprobrium and responsibility of being a spy, although he is infinitely more dangerous to his opponents than any ordinary spy.

In fact, at present, the flying man escapes largely for the same reason that an enemy did, in a supposititious case once put to an accomplished international lawyer. As stated, the primary element existing in a spy is clandestine action. So, it was asked, suppose an enemy on a ship in Boston harbor takes off all his clothing, swims to the Charlestown navy-yard and collects valuable information in time of war before he is caught. Is he a spy? It was decided that technically he was not, although his exoneration came on a clever quibble,—that a man in his natural skin could not be disguised.

Even the status of aeronaut or aviator can thus be seen to be practically undefined, and a possible solution of the matter will be to recognize a difference between those crafts used for scouting or communication purposes and those designed to secure more sinister and dangerous results to the enemy. A distinction in flags, or better, a specific emblem, for the former might serve to establish their character. The latter need not bother themselves much with that question.

This solution would be in line with the distinction already made in war. It is admitted that a man has a right to fight, scout and reconnoitre for his country. Those things are not to the interest of his enemy, but if he is caught at them, the enemy is prevented from treating him harshly for performing a patriotic duty, and he becomes merely a prisoner of war, and must be treated with the same consideration as the enemy's own troops.

The spy, on the other hand, is considered an enemy of the deepest dye. Seventeen articles of The Hague convention are concerned with guaranteeing good treatment to the prisoner of war. One deals with the treatment of a spy: "A spy taken in the act shall not be punished without previous trial."

This wide distinction being a fact, it is obviously unfair to put the subaltern carrying proper military messages between two commands of the same flag in the same category with the man who sets out to nose into the secrets of the opponent. The former evidently should be held only as a prisoner of war; the latter is a spy, and the enemy is entitled to protect himself adequately against his thirst for illicit knowledge. Notifications between hostile forces are now provided for in the case of hospital arrangements and similar matters. It might prove feasible to notify that certain aeroplanes, with a recognized mark, are engaged on purely technical business connected with the army and that their occupants, if brought down, are entitled to the status of prisoners of war. Such a notification would not stretch military honor farther than it has already been distended by convention, although it would have the disadvantage of making the other fellows unduly prominent when they began to spy. And undoubtedly in any army there would be found plenty of brave men willing to run the risk of treatment as a spy for the benefit of his country, without any such assurance.

Fauchille in his code stipulates that "war in balloons" (or aeroplanes) "is subject to the laws and customs of maritime war." This statement can scarcely prevail, for it places the aeronaut or aviator at too great a disadvantage. The air and the sea, notwithstanding close analogies, are not equivalent elements so far as navigation is concerned. There are cycles of development between the conquest of the water and that of the air—which depends upon a complicated, delicate and high-powered motor. Accidents that on the water would be negligible, in the air spell disaster. An ocean liner's engines stop and she continues to float safely. But if an aviator's motor slips up he is dashed to ground or glides in a fairly helpless condition to the earth. The dirigible itself is more nearly the prey of Nature if its engine halts than is the steamship.

Therefore, it seems only fair to the air-conqueror that he should be more generously treated than his fellow the seaman. In war, however, there is the supreme question of added danger to the attacked and of great advantage to be gained by the offensive use of air-craft. The consequent interplay of interests will make the problem of settling upon the aviator's rights and duties, privileges and responsibilities in war-time one of the most engrossing of legal problems. It will be both interesting and enlightening to learn what the first International Congress on Aerial Navigation which convened at the French Foreign Office a few days ago will have had to say on the subject.

But difficult as it will be to determine mere justice in such cases as have been mentioned, the problem will be magnified when different systems of law or variant policies complicate the affair. Germany, for instance, is unique in having had an aerial foe, the French in 1870. Bismarck, in the case of a capture of a French balloon manned by a British subject, maintained that his trial as a spy would have been justified, "because he had spied and crossed our outposts in a manner which was beyond the control of the outposts, possibly with a view to make use to our prejudice of the information thus gained." One condemnation in that war is on record, though the death sentence was commuted.

In the present legislation, belligerents—those having the right to fight—are carefully defined. Volunteer service or casual aid to the regularly armed forces by non-belligerents will be especially easy for owners of air-craft, and this point will demand attention, for upon its settlement depends the question whether the aviator shall be considered a qualified agent or an outlaw of his country.

(To be Continued in August AIRCRAFT.*)*

KITES

By Edward H. Young

The kite, that children's plaything, despised by scientists, is nevertheless deserving of the most serious consideration.—Euler (1756).

APPROPRIATELY enough, kite flying as an art was first known in the Celestial Empire. It is in fact, fully twenty centuries since it was first used by the Chinese for purposes of sport, trade and war, and even to-day there is no country where more varieties of kites, in form, design and shape, can be found than in Ancient Cathay.

Kite flying has, for so many centuries, been looked upon in China in a matter of fact way, that it has created for itself a lasting standard, which calls for its practise by grown men. They fly kites while the children look on, and they do not feel that any apology is expected of them for indulging in the occupation.

One advantage the Chinese have over Americans, is that they possess wood that is far more pliable than any available here and a paper which is lighter for its strength than the ordinary American paper: the wood is either rattan or bamboo and the paper is the rice crepe paper. Rattan is a very tough, straight-grained wood which can be bent into almost any shape without breaking; this facility, together with the toughness and lightness of the paper at their disposal, is the reason the varified construction of kites has been so fully developed among the Celestials.

In America, the wood readily available cannot be bent much without breaking and the paper is heavier, with the result that the forms of kites constructed are less numerous, and that they are more angular and also more closely related in principle. Though apparently a defect, this has proved in one way a blessing in disguise, for the cardinal principles underlying the construction of American kites bear a very close analogy to those underlying that of aeroplanes.

To illustrate: in aeroplanes there are four leading principles to consider: gravity, pressure, thrust, resistance. In kites we have gravity, pressure, resistance and lift, the latter corresponding with the thrust of the aeroplane.

Gravity is the downward pull on a flying object—aeroplane, kite, etc.,—; pressure is the upward tending of the air to sustain the flying object; resistance is the obstruction made by the flying object to the air it is passing through; the thrust of an aeroplane is represented by its forward motion in still air, and is entirely independent of any wind which may happen to be blowing: it is similar to the lift or pull of the kite, which, when not towed, is held up by such natural wind as there is at that moment.

Gravity and pressure being always opposed to each other should always be in coincidence both in aeroplanes or kites. Thrust or pull on the one hand and resistance on the other being always opposed to each other, they should also be in coincidence with each other. The flying centre of an aeroplane or of a kite is at the union of these four points or forces,—in the aeroplane where the engine and passenger are carried, and in the kite where the string is attached.

It is true that an aeroplane flies almost in a horizontal position, while a well poised kite flies at an angle of about 36 degrees, but the principles remain the same, the differences in construction being made with that object in view. In a kite the pull of the string corresponds to the thrust of the propellers on an aeroplane; the string holds the kite to one spot and allows the natural wind to sweep through or under the kite, thus maintaining it aloft; this natural current of air has the same effect as the artificial wind which the aeroplane creates for its own support when being driven through the atmosphere by means of its propellers.

As in an aeroplane, so in a kite must there be a proper proportion of lifting surface to weight and a proper proportion of resistance to thrust or lift. Again, the bridge-work or bracing in both aeroplane and kite must be analogous: as an aeroplane must have fore-and-aft balance so must a kite; horizontal rudders will obtain it for the former and keels will for the latter.

Another analogy between kites and aeroplanes is found in their form; thus a Malay or Eddy kite conforms to the principles of a monoplane such as a Blériot, an Antoinette or a Santos-Dumont machine; a box kite conforms to the principles of a biplane such as a Voisin, a Farman, a Curtiss, or a Wright flyer, while the triangular box kite conforms to the principles of the Langley "aerodrome."

We can thus see that there are numerous analogies between the American straight stick kite and the modern aeroplane. From this we gather that a kite is a good form to experiment with to obtain a knowledge of principles in aeroplane construction. Of course it should be understood that a kite must be figured on to fly at an angle of 30 degrees to the horizontal, and that allowance must be made for this difference of incidence when it comes to apply the figures to aeroplanes; a correct analogy can always be established, however, if this fact be kept in mind, and it is an excellent and inexpensive way to develop and test one's aeroplane ideas.

One more use to which the science of kites can be put is the investigation and study of the effect of the wind on the construction or "make-up" of the kite; for instance the locating of the centre of pressure and the precise way this stick or that surface affects the kite's behavior or equilibrium, and the exact reason why.

This analogy and this co-operation between the science of kite flying and that of aviation are by no means limited to the above; they could be kept up for all the leading points of construction, and besides the great amount of knowledge derived, (for the field is practically a virgin one and few or no published tables and results are available) a high skill in the flying of kites would be obtained, a skill which would be found to be of great value if it were ever contemplated to enter the aeroplane field.

Thus kites have an ancient lineage,—they are in fact, by many hundreds of years, the first air-craft which ever rose above earth —and through modern efforts, the science of building and flying them has taken on a new lease of life and reached so high a plane of human usefulness that to deny its existence as a science and to despise it as such, is but to make a signal show of ignorance.

NEW FLYERS DESCRIBED

THE BALDWIN BIPLANE

By W. H. Phipps

WHEN the news was received last March that Captain Thomas S. Baldwin had designed and put together a heavier-than-air machine, it is no exaggeration to say that it was received with very great interest by every American interested in aerial navigation. What one might aptly term Capt. Baldwin's vast aerial experience was known to all, and in consequence his contribution to the solution of the problem of human flight was looked forward to with more than ordinary interest.

We publish drawings of the Baldwin biplane, showing it both in its present form, as it is now flown in by its designer at Mineola, and in its original and intermediary forms.

Originally this biplane was not unlike the Roe triplane (see March AIRCRAFT, page 6) of England, with the upper plane removed, for it had the chain-driven tractive propeller in front and the biplane horizontal rudder at the rear encompassing a vertical rudder and supported on a skid when on the ground; in other ways, however, it was radically different from the Roe machine, having no covered-in body or "fuselage" and no spring shock-absorber in front, in other words, although embodying certain features associated with monoplane construction, it showed less of them than the English machine.

The distinctive feature of the Baldwin biplane at that time was the device designed for lateral control. Capt. Baldwin has always believed in Israel Ludlow's ideas for insuring lateral balance by dihedral angles; he did not embody this principle in this machine, but adapted another device on which Mr. Ludlow has applied for a patent: a single vertical surface, pivoting on a vertical shaft like a rudder, above and in the center of the main upper plane (the resistances developed when it was acted on being expected to maintain lateral equilibrium, when this was endangered). This device as far as it is known, infringes on no patents.

The biplane as originally designed was first tried out in Hammondsport. When Capt. Baldwin took it down to San Antonio the rear horizontal rudder had been made into a fixed tail; a horizontal rudder had been placed in front; the motor had been moved to the rear of the lower plane, and the propeller placed behind it in a propulsive capacity, while the aviator's seat, from being behind the planes was placed in front of them, thus practically changing places with the motor plant. The wings or planes were also temporarily set at a dihedral angle of about 18 degrees.

When the machine appeared at Mineola a further change had been made in it, "Curtiss" ailerons between the planes having replaced the central vertical fin as lateral stabilizers. It is in this form that the popular veteran of the air—Capt. Baldwin is fifty-seven years old—has flown at Mineola. Both Curtiss and Hamilton made remarkable flights in this machine recently, and the steady progress of Capt. Baldwin warrants the belief that he too will be cutting capers in the air before long.

Dimensions and details of construction of the Baldwin biplane follow:

MAIN PLANES.

The main planes have a total span from tip to tip of 31 feet 3 inches, and a fore-and-aft chord of 4 feet 6 inches. They are single surfaced being covered on the upper side of the ribs with Baldwin rubberized cloth. "Curtiss" ribs, of the standard curvature turned out by the Hammondsport factory, are used on this machine. (See Fig. 7 and 8, Construction Details, page 190.) The main planes are spaced 4 feet 6 inches apart.

THE TAIL.

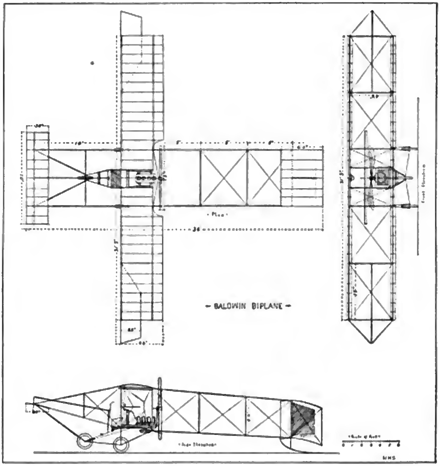
The tail, which is also of the biplane form, is constructed on similar lines to the main planes. It is situated 15 feet behind the main frame, and carries a skid to support it, when on the ground.

THE ELEVATOR.

It differs in type from the main planes, for in the first place it is of the monoplane type, and secondly it is double surfaced. The span is 10 feet and its chord is 30 inches.

VERTICAL RUDDER.

The rudder is situated between the two surfaces of the tail and is of irregular shape. This rudder is operated by the steering wheel as on the Curtiss machines.



AILERONS.

The ailerons now used to maintain lateral balance are double surfaced and flat. The span is 105 inches, and the fore-and-aft depth 25 inches.

RUNNING GEAR.

The running gear consists of two 20 inch wheels in front and a skid under the tail. A third wheel is placed in front of the twin wheels and normally does not touch the ground, its capacity being only to deflect the shock in making a steep landing (see drawing). No springs are used in connection with the wheels, the whole being rigidly mounted on steel tubes.

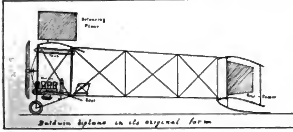
PROPULSION.

This is furnished by a 25-h.p. 4-cylinder Curtiss water-cooled motor driving, through a chain and sprockets, a 7 foot 6 inch propeller which it turns at about 800 revolutions per minute. Capt. Baldwin is said to have ordered an engine of greater power.

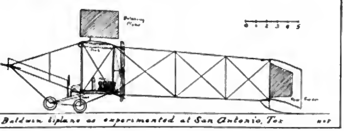
The biplane was built at the Curtiss factory in Hammondsport, and the construction details are the same as used on the Curtiss machines.

All trussing has been done with steel cable instead of the usual piano wire, the joints being bent around and then soldered to insure safety.

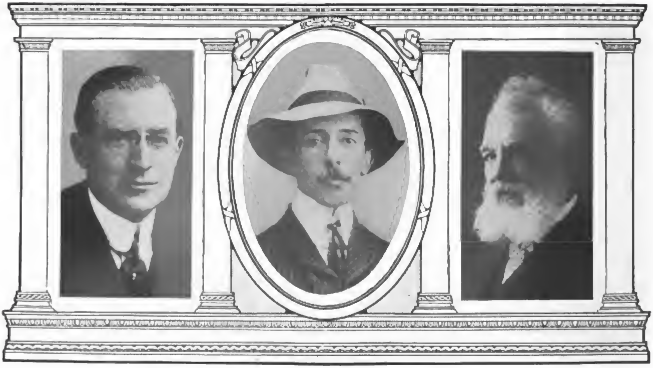
The total weight of the biplane is approximately 600 pounds.



Baldwin biplane in its original form



Baldwin biplane as experimented at San Antonio, Tex



BIG MEN OF THE MOVEMENT

CLIFFORD B. HARMON

THAT Clifford B. Harmon should be the premier amateur aviator of America to-day speaks well for the prospects of aviation as a sport pure and simple, in this country.

Mr. Harmon is also keenly alive to the scientific and military aspects of the question and is deeply interested in seeing this country in the lead in all phases of the movement.

It is the patronage of just such men as he which gives to the Art and retains for it, that dignity of which, as one of the most startling developments of man's genius the world has ever known, it is so deserving.

Mr. Harmon has been interested in aeronautics for some time past; last year he indulged extensively in ballooning, his most notable trip being that in which he and Mr. Augustus Post left St. Louis in his balloon "New York," on October 5, and landed 48 hours and 26 minutes later at Edna, Mo.

This is the only occasion in American history on which a balloon has remained up two days, and as such it still constitutes the American record for any kind of an air-voyage, but the remarkably feature of the voyage was that all records for height attained, in the Western Hemisphere, were also beaten.

It was as a passenger of Louis Paulhan at Los Angeles that he first experienced the joys of flying. In this manner he made a long cross-country flight on January 10th, going out to Redondo and back to the aviation field; he later purchased Paulhan's Farman (the holder of the world's height record) and has of late been teaching himself to fly at Mineola, near New York.

This apprenticeship may be said to have ended on May 21st, when he passed the tests (three flights of five kilometres each) necessary to qualify as an Aero Club of America pilot of a heavier-than-air machine.

After business hours, while others turn to the links or the courts or scorch along the high roads, he runs down to Mineola and spends the balance of the afternoon soaring at forty miles an hour, a hundred or more feet above the adjoining plains.

His ambition is to retain the two Gordon Bennett Cups for America. He wishes to use an American-built racer in the aviation contest, and is counting on a 100 H. P. Gnôme motor he has recently ordered, to drive it to victory.

A mere list of the "open air clubs" which count him among their members would in itself show how versatile and eclectic a sportsman is Clifford B. Harmon; among these might be mentioned outside the Aero Club of America, of which he is a vice president the Rose Tree Hunt, Philadelphia Athletic, Larchmont Yacht, Seawanhaka Yacht, New York Athletic clubs. He is also a member of the Automobile Club of America and is an expert motorist.

SANTOS-DUMONT

ALBERTO SANTOS-DUMONT was born some thirty-seven years ago near São Paulo, Brazil, where his father had a large coffee plantation. Many men have contributed to recent progress in Aeronautics, but it is very doubtful if anyone has done more to stimulate public interest in the new art than the famous Brazilian.

The first air-craft that this famous navigator of air ever saw was a small spherical balloon which made an ascension at a fair in São Paulo, in 1888. He made several trips to Europe in the next few years, and in 1897 made his first balloon ascension with Lachambre, of Paris. The next year he undertook the construction of the first of the long line of air-craft with which his name was to be associated.

Santos-Dumont built altogether twelve dirigibles, the most famous of which were his No. 4, No. 6 and No. 9. As mentioned on page 133 of this volume (June AIRCRAFT), he won the prize of 100,000 francs of M. Deutsch (de la Meurthe) by circling the Eiffel Tower of Paris, and returning to his point of departure, in the Aero Club of France grounds at St. Cloud, in half an hour.

From 1898 to 1904 Santos-Dumont was in the public eye as the most prominent, the most enthusiastic, and also the most daring experimenter in navigating the air. In 1905 the rumors which reached him concerning the experiments of the Wright brothers in America, and also the efforts being made in France, by such men as Ferber, Archdeacon, Bleriot, Voisin and Esnault Pelterie to solve the problem of heavier-than-air craft turned his attention towards the possibilities of aviation, in which so few believed at that time.

On August 14, 1906, at the Polo grounds, at Bagatelle, near Paris, Santos-Dumont succeeded in leaving the ground for a second or two in a crude aeroplane of the cellular or box-kite type, driven by a 24-h.p. Antoinette engine. The Wright brothers' earlier successes were at that time almost universally disbelieved, and the Brazilian's feat created a tremendous sensation throughout Europe, where it was hailed almost as a miracle; in fact so impossible was mechanical flight considered only four years ago that very few outside of those who actually witnessed the "levitation" at Bagatelle believed that it actually took place.

The present type of Santos-Dumont aeroplane, well-known to all followers of aviation, as the "Demoiselle" or Dragon Fly monoplane, is one of the smallest and fastest flyers as yet built. It is perhaps because he is himself a small man physically that the "Demoiselle" has been far more successful when piloted by its inventor than by his pupils, but there is no doubt that this is also owing very largely to his great experience in aerial matters.

Santos-Dumont has recently made some sensational cross-country flights in his diminutive aeroplanes.

ALEXANDER GRAHAM BELL

ALEXANDER GRAHAM BELL, the inventor of the telephone, has turned his attention to aeronautics for some years past, but the experiments made by him with a man-lifting kite in the Winter of 1907 were the first in this line to attract universal attention.

They were carried out near Dr. Bell's beautiful home, at Baddeck, Nova Scotia, and the kite used embodied the famous principle expounded by Dr. Bell, being composed of over three thousand tetrahedral cells.

With kites and aeroplanes of the ordinary type if one increases the size of a given model, the weight increases not in proportion but as the cube of the dimensions; at the same time the supporting surface is increased as the square of the dimensions; in consequence the limit in carrying capacity is quickly reached.

Dr. Bell set about to discover a mode of construction whereby the weight did not increase in any greater proportion than the lifting power, when the size was increased; the tetrahedral principle was the result of his researches and it was with his big kite—the "Cygnet"—that he proceeded to test it.

These tests were successful, the kite on one occasion carrying up the late Lieutenant Selfridge a hundred and seventy feet above the waters of the Bras d' Or lake.

Dr. Bell then founded his celebrated Aerial Experiment Association from which so much good to American Aviation was to derive.

The winter headquarters of the Association were established at Hammondsport, N. Y., and five motor-driven machines were built in turn: the "Red Wing" designed by Lieut. Selfridge, the "White Wing" of Mr. Baldwin, the "June Bug" of Mr. Curtiss, the "Cygnet II," the giant motor driven "Tetrahedron" of Dr. Bell, and the "Silver Dart" of Mr. McCurdy.

The "Cygnet II" had 5,000 tetrahedral cells and was driven by a 50 H. P. Curtiss motor; the propeller broke on an early trial and experiments in this line were temporarily discontinued.

The "Red Wing" made the first public flights ever made in America and the other machines, which were also biplanes, were each an improvement over their immediate predecessor; they were the direct forerunners of the eminently successful aeroplanes since turned out by Glenn H. Curtiss at Hammondsport and by Baldwin and McCurdy in Canada.

Not content with acquiring undying fame as the inventor of the telephone, Alexander Graham Bell is thus contributing an earnest share towards the solution of the great aerial problem.

What seems not to be generally known is that Dr. Bell has also been identified with the discovery of the graphophone.

Dr. Bell has now left for Europe, where another great American pioneer in aerial navigation,—Octave Chanute—is also, at the present time.

BIG MEN OF THE MOVEMENT

HUGO C. GIBSON

HUGO C. GIBSON is an edifying example of the type of men connected with the flourishing automobile industry, who have drifted into the newer, but just as promising, industry of air-craft.

Born in 1874, in Worcestershire, England, he was educated at the City of London College where he conducted the engineering columns of the school paper and at the City and Guilds of London Technical College.

The internal combustion engine was at that time just emerging from the embryonic stage and Gibson already showed particular interest in such studies as applied to this latest form of power-plant.

It was, however, to the construction of a steam launch that he first applied the keen mechanical instinct which was later to give him a position of note among consulting engineers in this branch of applied science.

His direct interest in the latest form of land locomotion began some fifteen years ago when he purchased one of the early De Dion 1¾ H. P. tricycles which afforded him his first experience with the type of engine which was to revolutionize road traffic in the next few years and with which he was to become so familiar, during its development.

In 1897 he became an associate member of the Institution of Electrical Engineers and became a contracting mechanical and electrical engineer, a profession which, with politics, shared his interest during the next few years.

Four years ago he became interested with Mr. Dugald Clark, Professor Carpenter, Denton and others in the Selden lawsuit, which is to the automobile industry what the Bell litigations were to the telephone and what the Wright lawsuits may prove to be to the present early forms of flying machines. Mr. Gibson, as a technical expert for the Association of Licensed Automobile Manufacturers, was on the winning side of the Selden lawsuit and clearly had a share in bringing about the victory of the patent holders.

Hugo Gibson has now entered the aeronautic industry in earnest and has undertaken the manufacture of the power and propelling plant of aeroplanes, using original designs of his own, both in motor and in screw propellers. He has carefully gone into the requirements of aerial engines and propellers and is devoting his intimate knowledge of the theory and practice of internal combustion engines and of physics generally, and gases in particular, to turning out a mechanism entirely fitted for the purposes for which it is desired: i.e. propelling a vehicle through a yielding and elastic fluid.

Mr. Gibson is a member of the Automobile Club of America, the Aero Club of America and the Aeronautical Society of New York; what leisure time he has he devotes to yachting.

GABRIEL VOISIN

GABRIEL VOISIN, the elder of the famous Voisin brothers, was born some thirty years ago at Belleville-sur-Saône, near Lyons.

Although the name of Gabriel Voisin is usually associated with the construction of aeroplanes, his role in aeronautic history was not confined to designing and building flyers: he tested his ideas in person and was lucky to survive the early days of flying without sustaining injury.

He was the first to follow the advice and example of Ferber and to repeat at Berck, on the shores of the English Channel, the gliding experiments of Lilienthal, Pilcher, Herring, Avery and the Wright brothers.

In 1904 he was interested with Archdeacon and Bleriot in experiments of towed flight over the Seine, and himself mounted the big kite on most occasions, in tow of the racing motor-boat "La Rapière."

In the Fall of 1906, the Voisins started work in earnest, and early in the following year their first aeroplane—that of Delagrange—was ready.

Here again it was Gabriel Voisin who took the helm and first piloted his machine off the ground (March, 1907).

It was not until seven months later that Delagrange was himself to make flights, but in the meanwhile, a second Voisin biplane had been built for another enthusiast and believer: Henry Farman.

Within four months he had won immortal fame through winning the Deutsch-Archdeacon prize of 50,000 francs for a flight of a circular kilometre and the dream of Gabriel Voisin began to show signs of coming true.

For several months Voisin biplanes enjoyed the unique distinction of being the only machines known to be capable of sustained circular flights.

But the advent of the great American pioneers did not curtail the activity of Voisin, who claimed for his biplane natural lateral stability, through the use of fixed vertical surfaces between the main planes and whose machine of this type is no infringement of the Wright patents—as recently admitted in Court by the Wrights themselves.

Notwithstanding Wright's presence in France in the summer of 1908, and his daily trials near Le Mans, it was Delagrange's Voisin which made the first half-hour flight ever made in Europe, getting within less than eight minutes of the Wrights' world's record of 1905.

Farman flew 44′ 32″ in October, 1908, which was to be the record for French-built machines for many months, but it was Louis Paulhan who was to show what could be got out of Voisin's conception. The great little Frenchman's long distance flights in windy weather went far towards convincing a doubting world of the future of flying.

Others eminently successful in handling Voisin biplanes are Bunau-Varilla, Rougier, Bregi, Métrot, and the Baronne de Laroche—the first woman to fly.

HORACE B. WILD

PROMINENT among the men who have made a profession of the practice of aeronautics is Horace B. Wild.

Although originally, and still, an electrical engineer, he has been a close student of aerial navigation for over twenty years. In fact, Horace Wild's interest in aeronautics appears to date back to the fatal balloon voyage of Professor Donaldson, which terminated in Lake Michigan with the loss of two lives, and of the start of which Mr. Wild was a witness: notwithstanding its disastrous termination, it fired his imagination and incited him to take up ballooning.

In 1889 Horace Wild made his first montgolfière or hot-air-balloon ascension and parachute descent. This performance was followed by many others of a similar character, Wild becoming one of the most proficient professionals of the day. He had several narrow escapes and finally gave up this spectacular side of professional ballooning for more useful experiments.

His first trip in a motor driven gas-bag took place some five years ago at Chicago. On January 3, 1903, he successfully drove his dirigible, the "White City Eagle," over the house-tops of the big city, and on July 14, 1906, he started from the White City Grounds and, sailing once more over Chicago, circled the Masonic Temple, and returned to his starting point at White City in 1 hour and 45 minutes: this was his first out-and-home trip. Mr. Wild exhibited his airships at most of the leading cities, and claims to have made altogether 600 dirigible ascensions. On one occasion, on September 14, 1908, at the Louisville, Ky., fair grounds, he remained in the air 5 hours and 20 minutes which, we believe, is an American record for dirigibles. Horace Wild has also made a score of ordinary balloon trips: in this way he sailed over the Great Lakes, and also crossed the Sierra Nevada in California in the balloon "United States"; his longest continuous trip lasted 24 hours and 25 minutes.

Mr. Wild has recently become interested in aviation and has already flown. He has moreover a factory in Chicago devoted to the manufacture of aerial vehicles and apparatus of every kind.

As an electrical engineer he designed the lighting and wiring of White City, near Chicago, with which well-known resort he is still professionally connected. He devotes, however, eight months of the year to aeronautics, in the practice and in the propaganda of which he becomes more interested every day.

The Aero Club of America, the Aero Club of Illinois, the Aeroplane Club of Illinois number Horace Wild among their members: he is also an honorary member of several other American Aero Clubs.

He has recently been giving demonstrations in Illinois with a Curtiss biplane, and has been lecturing on aviation throughout the state.

Foreign News

By Albert C. Triaca

THE SECOND CHANNEL CROSSING: JACQUES DE LESSEPS REACHING THE ENGLISH COAST, NEAR DOVER

Argentine Republic

Brégi is still at Buenos Ayres; he expected to take part in the contests projected at the end of May at Villa Lugano, for which altogether $30,000 in prizes had been voted. Valleton had also entered.

A pupil of Brégi, Dr. Roth, recently made a fine flight on Brégi's Voisin.

Austria

Vienna is keenly anticipating the visit of the Zeppelin V, the world's largest air-craft. Count Zeppelin is expected to be in personal charge of his latest creation when it leaves Friedrichshafen; the voyage is planned to take place in June, if the huge airship is ready to take to its element at that time.

One of the most remarkable aeroplanes as yet produced has been recently experimented with with great success near Vienna. It is the latest monoplane of the famous Austrian inventors, Etrich and Wels. No more bird-like flying machine than this has as yet flown. It is called the "Taube" (pigeon) and, under the direction of Etrich, has made several remarkable flights, on one occasion flying with two passengers, and on another flying continuously for 1 hr. 11 min.

On May 12th, with Illner at the helm the monoplane flew from Wiener-Neustadt to Vienna and back, 54 miles altogether,—going out in the morning in 32 min., and returning in the evening in 42 min.

Belgium

An interesting monoplane has just been constructed at Liege by F. Moulin. One feature about this machine is that lateral equilibrium is obtained through bending the entire rear extremity of the wings, thus changing the angle of incidence in the whole plane.

The dirigible "Belgique II" recently made several trips above the exhibition grounds at Brussels.

Canada

At a meeting held at the Windsor Hotel, at Montreal, on June 1, several Canadians of prominence interested in aviation decided to request the Dominion Government to subscribe funds to enable Baldwin and McCurdy to compete for the big "Cross-Country" prizes recently offered in the United States.

Denmark

The Danish Aeronautic Society is to hold an aeronautic exhibition in the old frigate "Jylland" now moored at Langelinie. Models and accessories of all kinds pertaining to air-craft will be on show.

Egypt

Plans have been started by members of the Imperial Aero Club of Germany for an aeroplane exploration of the Desert of Sahara, assisted by automobiles. Conditions along the Nile valley are to be the special object of the investigation. The cost of the expedition is estimated at $180,000.

England

The general excitement and enthusiasm caused by the great Cross-Country flights last month had hardly subsided before the Cross-Channel feats of Jacques de Lesseps and of Rolls stirred it up anew. De Lesseps' flight, which took place on May 21, was a re-edition of the historical "First Crossing" accomplished by Blériot exactly three hundred days before (July 25, 1909).

The machine used was a Blériot monoplane fitted with a Gnôme motor; the flight took place in the afternoon and lasted about 45 min. The aviator had some difficulty in keeping to his course owing to fog.

By this flight, as indicated in last month's AIRCRAFT, de Lesseps won the Prix Ruinart, which had escaped Blériot last year, through a technicality.

The flight made by the Hon. C. S. Rolls on his British made Short-Wright biplane, June 2, both started and ended on the English side of the Straits of Dover; he left Dover late in the afternoon and after reaching the French shore, circling above it, and dropping weighted letters there, returned to England without alighting, and landed at the very spot from which he had started. This flight of about 50 miles lasted 80 minutes.

The Royal Aero Club of Great Britain has already been asked to sanction six flying meets to occur this summer and the prizes for which exceed $200,000; Huntingdon will be the first meet; it will be followed by the great Bournemouth Carnival in July. Another big series of contests is to be held in Scotland at Lanark.

France

Aviation meets are being held all over the country, and the competition to secure the more famous professionals is very keen among the organizers. At the Tours meet, which followed upon the heels of the Nice week, the most successful winner was the English aviator Captain Dickson.

At the Lyons meet, Van den Born, Legagneux, Paulhan and Latham shared the honors; but the success of this tournament was sadly marred by the death of Hauvette-Michelin, who, in a flight made late in the afternoon of May 13, took a turn too short and hit the turning post, causing it to turn over and crush him. This extraordinarily unlucky accident—the first of its kind to occur—ended the career of one of the Antoinette monoplane's most promising drivers. A picture of his machine in action at Heliopolis was published in the April number of AIRCRAFT (page 60).

The first town-to-town flying-machine race took place on June 6 during the Angers meet; the course (from Angers to Saumur) measured 26½ miles as the crow flies, the distance by rail between the two towns being 30 miles.

Martinet proved the winner, in the splendid time of 31 min. (51 miles an hour), Legagneux was second and Dickson third; all three used biplanes fitted with Gnôme motors; Martinet and Dickson, Henry Farmans, and Legagneux a Sommer.

Among the great cross-country feats of the month may be cited flights by Roger Sommer of 90 miles one day, and of 100 two days later, of Cheuret (55 miles with a passenger), of Maurice Farman (30 miles with a passenger), when he flew, on May 21, from his aerodrome at Buc to pay a visit to his brother Henry's new agency and school at Etampes.

Another who has made great flights is Lindpainter, who, on May 24, flew from Mourmelon to Reims where he circled the famous old cathedral, thus making an actual reality of the conception of the artist who designed the poster of the Reims meet, last year, which showed the biplanes soaring about the historic towers. There is also Marconnet who flew from Mourmelon to the outskirts of Paris, and the military aviators Féquant and Martinet, who have been making most interesting experiments, the one driving and the other consulting the map and making topographical sketches; this team appears now to be quite ready to play a useful part in military manœuvres; their machine, like that of nearly all the successful cross-country flyers, is a Henry Farman, fitted with a Gnôme engine.*

The Aviation Schools at Pau, Buc, Etampes, Mourmelon, Lyons, Juvisy, Issy, Mouzon, etc., etc., are showing tremendous activity, and the number of competent aviators turned out is only limited by the number of machines available, notwithstanding that all the aeroplane factories are working overtime to supply the tremendous demand. New companies are being formed and new machines being exploited with varying degrees of success, and it is not too much to say that hundreds of flights are being made every week.

The Reims meeting is now definitely fixed to take place from July 3 to 10, and promises to retain its place as the premier French meeting. The course this year will only be 5 kilometers around instead of 10 and will be hexagonal in form, two of the corners being right angles, and the others forming practically a gentle curve, which will be conducive to high speed. The prizes offered amount to 200,000 francs, and of this 50,000 francs go to the constructor whose machines taken altogether cover the greatest distance during the meet; 30,000 francs go to the aviators making the longest flights without landing (of which 20,000 francs go to the first); 15,000 are allotted to the aviator whose flights cover the greatest total distance, the second getting 8,000 francs, the third 4,000 and the fourth 3,000. There are also prizes amounting to 10,000 francs to the aviators making the best flights in the Gordon Bennett elimination trials for Frenchmen, and 15,000 francs for the two highest flights; 5,000 for the officers' prize; 5,000 francs for the ladies' prize (for the two "aviatrices" doing the best time at 10 kilometers), 5,000 francs as a passenger prize, 15,000 for speed prizes, in addition to daily prizes for the three best performances in distance, height and speed. Besides all these there is a special prize of 5,000 francs for any aviator who, during the meet, beats the world's distance or height record, and there is a prize of 15,000 francs to the first aviator and 900 to the second, who shall cover the greatest total distance.

By way of adding to the interest and keeping the people amused, should it be windy, there is a first prize of 7,000 francs and a second prize of 3,000 for man-carrying kites, and, of course, outside of the actual prizes belonging to the meeting there are always the Paris "Daily Mail" and Michelin Cup prizes, for which a man can compete whenever he likes. M. Michel Ephrussi has in addition given a prize of 10,000 francs for a straightaway race outside of the aerodrome, the competitors all starting at the same time.

The organization and management of this meet may well serve as an example to those about to organize American meets. It is questionable, however, whether it would not be of more interest to the spectators to have duration of flight considered as a prize winning standard rather than distance over the ground, for the latter induces the competitors to fly strictly over the course for hour after hour, and further diminishes the chances of the slow machines, which are often more desirable as air-craft than the swift ones, which of course have the speed prizes as the natural reward of their speed.

On May 7, at Pau, Blériot made a flight for the first time as a passenger. The machine was the new type two-seater Blériot. The pilot was Alfred Leblanc and the flight lasted 25 minutes.

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* As we go to press we learn of the marvellous two-man cross-country flight made by Marconnet and Fequant on June 9th: 106 miles. This almost doubles Cheuret's world's record.

The number of pilot aviators to date is about one hundred and is rapidly increasing.

Lieut. Savoia of the Italian Engineer Corps, formerly an unsuccessful Wright pupil, has joined the Farman school at Mourmelon.

De Lesseps' cross-Channel flight of May 25 is referred to under "England."

THREE WELL-KNOWN FIGURES IN FRENCH AVIATION CIRCLES: LOUIS BLÉRIOT, RÉNÉ DEMAREST AND GABRIEL VOISIN

Among the latest women aviators to make flights are the well-known actress Jane Herveu, Mme. Naef, Mme. Frank, who in private life is Mrs. Hewartson, the wife of the well-known Paris correspondent of the London Daily Mail, Mlle. Rose Itier and Mlle. Aboukaia.

Bréguet is to build a new biplane, both lighter and faster than his last production.

Witzig accomplished a flight at Issy on May 21 on a two-propeller monoplane. This machine embodies some improvements on the aeroplane of a similar type which he experimented with last winter.

Germany

The first of the seven flying meets already organized for the present Summer, that of Johannisthal (Berlin), took place from May 10 to 15 and was a great success. As has occurred at all the meets this year so far (except that at Heliopolis), the Farman biplane once more carried off the honors for greatest distance flown and time spent in the air. Captain Engelhard, however, on his German Wright, put up a strong fight against the Farman champion Jeannin, and took first prize in passenger flights, while de Caters, on his Voisin, won first prize in the landing, gliding and steering contests. Alfred Frey, who has both a Sommer and a Farman, also did well; on May 23, he had the audacity to fly right over the heart of Berlin, remaining in the air 67 minutes—for the most part at a great height. He was very wisely fined by the municipal authorities. It is to be hoped that stringent legal measures will be taken to curtail the prevalent craze to fly over cities in the present stage of the art; it is probable, however, that this will not be generally brought home to those responsible until a motor stops during such an urban incursion, and a descent has to be made in a city street or in the still less inviting landing place afforded by roofs and chimney pots.

Hungary

The entrants for the great aviation meet now being held in Buda-Pest, on which the very large sum of $160,000 is being spent, number forty-two; besides those of fifteen native aviators the following machines are entered:

8 H. Farman biplanes.
3 Voisin biplanes.
2 Wright biplanes.
2 Sommer biplanes.
2 Sanchez-Besa biplanes.
1 Marchalowski biplane.
2 Etrich monoplanes.
2 Antoinette monoplanes.
2 Blériot monoplanes.
2 Hanriot monoplanes.
1 Grade monoplane.
1 De Pischoff monoplane.
1 Schindler monoplane.

Paulhan, Latham, Chavéz, Efimoff, Frey, Illner, Etrich, D. Kinet, Leblanc, Rougier, Wienczers, Mme. de Laroche, are among the cracks entered.

Italy

The first Italian-made dirigible is that which Mr. Nino Pilheo has just completed: capacity, 1,850 cubic metres; length, 42 metres; maximum diameter, 8.25; engine, 35 H. P. S. P. A.

The meetings held at Palermo and at Naples, although hampered by bad weather, gave to the Southern Italians a fine opportunity to judge the latest progress of the art; Daniel Kinet, Busson, Kuhling, Wagner (the winner of the Grand Prize automobile race at Savannah in 1908), and Rigal, another famous motor driver, contributed mostly to their success.

Olieslaegers made a magnificent flight before Genoa on May 14, flying for 15 minutes over the sea at a height of 500 feet.

The Verona meet (May 22 to 29) was all that it promised to be. The struggle for the height prize between Paulhan, Efimoff, and Chavéz was thrilling in the extreme. On May 26, Paulhan reached a height of 3,815 feet, whilst Efimoff was only 220 feet below him, and Chavéz flew, himself, half a mile above earth.

Luxemburg

The aviation meet now taking place (June 5 to 12) at Mondorf promises to be a very great success, much enthusiasm having been excited by the recent flights of Wiessembach. Among those entered for the meeting is Barrier, the well-known Bleriot driver who has been making such remarkable flights in Spain of late.

New South Wales

The Wright biplane which has been experimented with in the neighborhood of Sydney, first by the Defries and then by R. C. Banks, had a short career. It was badly smashed up several weeks ago and appears to be beyond repair.

Portugal

After Zipfel, Poillot and Taddeoli, Mamet (who was the first man to ever fly in Spain) has paid a flying visit, in every sense of the expression, to Lisbon, he stayed but a couple of days during which he made some marvellous flights. On April 27 he soared over the Tagus at a height of 1,300 feet and was up half an hour, before landing to receive the congratulations of the Prince Royal and the Court.

Roumania

Deletang and Osmont have been flying in Roumania, the first at Jassy and the latter at Bucharest. Osmont must have greatly improved as an aviator since his visit to the United States last Winter; on May 14, he had as his passenger Mrs. Jean Camarassecheo, the daughter of the Minister of France to Roumania; later the Minister of Austria, Prince of Schoenburg-Hartenstein, enjoyed a flight with him. On May 17, he made a fine flight from Bucharest to Cotrocene with Prince Carol of Roumania as a passenger.

Russia

Before going to the Verona meet, Cattaneo was flying at Odessa on his Blériot, whilst Hélène Dutrieu and Bouvier were also making flights there on a Sommer biplane.

The St. Petersburg meet (May 8-16) gave the opportunity to thousands of Russians to see five of the most famous types of aeroplanes in action at the same time. Christiaens and Edmond drove Henry Farman biplanes, the former with a Gnome motor and the latter with a Renault motor; Prince Popoff showed what could be done with a Wright in the hands of an expert; the Baronne de Laroche guided her Voisin biplane to a height of 500 feet, which, it goes without saying, is the world's record for women, and made two flights, one of them of twenty minutes' duration, whilst Morane and Wienczers piloted Blériot and Antoinette monoplanes respectively. The Farman-Gnôme combination once more carried off the endurance prize with Christiaens, whilst Morane and Popoff fought it out for the height prize.

South Australia

South Australians are looking forward to their first view of a flying machine in action, a Blériot monoplane having recently arrived at Adelaide, from France.

South Africa

Kimmerling has been astonishing the Boers with his flights. He recently took a passenger for a trip on his biplane.

Spain

Among the exhibitions of flying recently given on the Peninsula may be cited those of Gibbs and Prévoteau at Bilbao, where, however, they were ill treated and menaced by the crowd; of Edward Storckel at Madrid, of Barrier at Cordova, where he flew for 50 minutes over the sleepy Andalusian town, and by soaring over the bull-ring accomplished the astonishing feat of distracting a Spanish crowd's attention from a corrida!

Flights have also been made at Valencia by Mamet.

Victoria

Harry Houdini, the handcuff-man, made a series of interesting flights early in the Spring on his Voisin biplane in the neighborhood of Melbourne. These are the first flights made in Victoria, but not the first made on the Australian continent, the honor for which belongs to Mr. Colin Defries, as pointed out in the May AIRCRAFT.

There is also a genuine Bleriot monoplane at Melbourne which is shortly to be tested.

European Club Notes

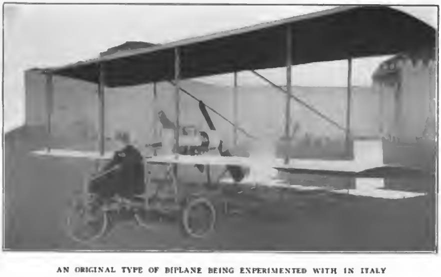
The Aero Club of France has founded six new prizes to be awarded to aviation debutants. Competitors will be expected to remain in the air at least one minute with their motor stopped. One of these prizes is of 1,000 francs; the five others are of 500 francs each.

The annual report of Mr. Besançon, Secretary of the Aero Club of France, shows that it counts 1,500 members and 33 affiliated clubs; a total of $400,000 in prizes will be given away by the Club or under the auspices of the Club in 1910.

What a splendid and practical example of propaganda to the other national clubs of the world!

At Paris has been founded a French aviators' club in which each section of a hundred members is to buy an aeroplane.

According to the bulletin of the German Aeronautic Federation, the number of Aero Clubs in Germany in 1909 was 46, with a total of 51,552 members.



AN ORIGINAL TYPE OF BIPLANE BEING EXPERIMENTED WITH IN ITALY

FLYING MACHINE MODELS

By W. H. Phipps

THE regular model contests held by the West Side Branch of the Y. M. C. A. were continued on May 7th at the Twenty-second Regiment Armory.

The winners were: F. M. Watkins, first, with a flight of 175 feet 7 inches; D. Grier, second, with 173 feet; S. Easter, third, with 160 feet 6 inches. Also flew: K. Stowel's front rudder monoplane, F. Schuber's Langley type monoplane, Mr. Sage's beautifully constructed Wright model, H. McAllister's, R. Coreshing's, P. W. Pierce's and G. H. Halpine's machines.

Another Y. M. C. A. contest took place on Saturday, May 21st at the Twenty-second Regiment Armory. A new cup was here offered by M. P. Talmage for the boys' class, for machines having two propellers. The first leg was won by Frank Schober, with 164 feet 4 inches; F. M. Watkins was second with 154 feet and 5 inches, and C. G. Halpin third with 139 feet 10 inches.

In the men's class M. P. Talmage's Wright model flew 152 feet 1 inch: the longest flight ever made by a biplane at any of the contests. Dr. Dederer gave an exhibition flight with his new machine, and succeeded in making 103 feet: the longest flight as yet made by any type of machine, in these contests.

One of the most successful model-meets so far organized in this country was that held by the Aeronautical Society on May 19th in the Sixty-ninth Regiment Armory building.

In the first contest for the Chanute Cup the first honors went to the boys. In the second the men had their innings, winning easily and establishing new records for model flying. Dr. Dederer's model was first with a flight of 204 feet; it is of the monoplane type with two large propulsive propellers in the rear; L. G. Lesh was second with 197 feet.

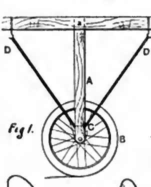


Fig 1.

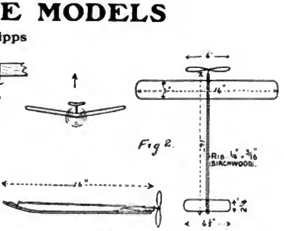


Fig 2.

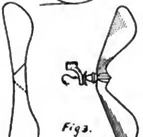


Fig 3.

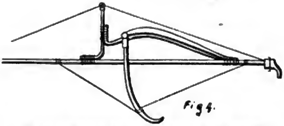
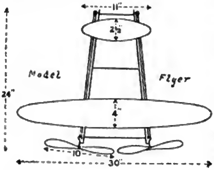


Fig 4.

Method of mounting main-plane, and providing machine with a shock-resisting skid.



From England reach us some interesting designs of models and model-construction details, for which we are indebted to the Editor of *The Aero*, the well-known London publication.

The model flyer shown in the illustration is of the two-propeller type. The main frame is constructed of 3-16 inch square ash; the planes can be made of wood 1-32 inch thick, or built up from small bamboo strips and covered with silk, either method working well. The propellers are constructed of 1-16 inch white wood, steamed to the correct pitch.

The main planes have a curvature of ½ inch. The propellers are ½ inch broad at the center, and 1 inch at the tips, and are driven by twelve 16 inch rubber strands at a speed of 900 revolutions per minute, with a pitch of 12 inches. The front elevator should be made adjustable: this can be done in numerous ways, as the builder sees fit.

A model similar to this has flown *1,000 feet* and is sold in London for $15.00.

Model Construction Details

Fig. 1 shows a landing chassis for models—A is the swinging strut to hold the wheel B from hooks D, from D to C are rubber bands stretched tight. This allows of the wheel springing on hitting the ground and saves a lot of breakage.

Fig. 2 shows an extremely simple but very good model much favored by model builders abroad and largely used here; it flies well over a hundred feet; its dimensions are marked on the sketches; the planes can be made of very thin white wood or cardboard bent to a dihedral angle.

Fig. 3 shows sketches for making propellers. The patterns are cut out of thin wood, and tha tips are bent to about 28 degrees at the kettle spout, and slightly hollowed at the same time. This process should be repeated several times. The same wooden block used in conjunction with fretworker's iron clamps greatly assist in bending these propellers.

Fig. 4 is a design for a landing chassis for models.

THE WRIGHT SUITS: SOME CONCLUSIONS TO BE DRAWN

By William R. Rummler

SUFFICIENT time has elapsed since the preliminary injunctions were granted in the suits of the Wright Company against the Herring-Curtiss Company and against Louis Paulhan so that these matters may be viewed in the perspective by persons who are not intimately connected with the litigation and who are, therefore, not likely to be influenced by the details surrounding the contentions of the litigants.

Apparently the most prominent general impression that now remains in connection with the decisions of Judge Hazel and Judge Hand in granting the two injunctions, is that both judges were disposed to give to the Wright patent the broadest possible construction for which they believed that lawful grounds could be shown to exist. As a general rule, on patents of comparatively recent issue, which have not been adjudicated by a previous court decision, the courts are disposed to be less liberal to the patentee than they were in this case, in resolving doubts as to the meaning of the patent, when asked to grant a preliminary injunction.

It is natural, in view of the great achievement of the Wright brothers, that even trained judges should in a measure be influenced by the same spirit as the general public in offering praise and support to the victors in a contest which has extended over so many years, and in which so many others fell short of reaching success, even though it is now seen that their efforts fell barely short of success and that they were so near the goal that one could hardly term such efforts as failures. Great caution must be now exercised not to let our enthusiasm for the victors take away from their numerous contestants and fellow workers, any of the rights which they had already acquired.

The greatest achievement of the Wright brothers, to my mind, was not an achievement in mechanical construction or in the invention of a mechanism, but was an achievement in the method of flight; i. e. in the method whereby old mechanisms (aeroplanes and vertical rudders) might be so manipolated as to be successfully used in flight.

The Wright patent necessarily is not, and could not under the law have been made broad enough to cover the achievement of the Wright brothers in the art of flight. It could not be lawfully made broad enough to cover what is most important to the public in that achievement, and that is the manner or method of flight, or the manipulation of old devices (aeroplanes and rudders) in a certain manner so as to permit them to be successfully balanced and guided while being propelled through the air. What their patent covers even in its broadest sense is necessarily only mechanical embodiments or illustrationa of certain broad ideas which they utilize in flying according to the methods which they discovered were feasible.

For example, the main claim in controversy in the Wright patent (Claim 7) reads as follows:

> "7. In a flying-machine, the combination with an aeroplane, and means for simultaneously moving the lateral portions thereof into different angular relations to the normal plane of the body of the aeroplane and to each other so as to present to the atmosphere different angles of incidence, of a vertical rudder, and means whereby said rudder is caused to present to the wind that side thereof nearest the side of the aeroplane having the smaller angle of incidence and offering the least resistance to the atmosphere, substantially as described."

If we were to understand the word "caused" in its most commonly accepted sense, we here have a definition of a device in which the "means," or connecting mechanism, *causes* or, as some of us would say, compels, the rudder to move toward the side of the aeroplane presenting the smaller angle of incidence to the atmosphere, whenever said lateral portions are given the angular movement mentioned in the first part of the claim. Take away the connecting mechanism, so that the rudder might be moved by the operator at will toward either side of such aeroplane regardless of which side presents the greater angle of incidence, then we can see that in order to construe the claim as covering the latter structure, it is necessary to give to the word "caused" quite an unusual meaning; that is, it is necessary to give it practically the same meaning as the word *permitted*. If we read into the claim the word *permitted* in the place of the word "caused," then let us see whether we still have a definition of a mechanism or whether we do not in fact so radically change the claim that it becomes virtually a claim for a *method* of flying. That is for a method of manipulating, in a given manner, an aeroplane of admittedly old form, with a vertical rudder, and which method consists in the *act* of moving the rudder toward the end of the aeroplane having the smaller angle of incidence whenever the ends of the aeroplane are given their angular movement, although the device may have no mechanism in any way connecting such movement of the rudder with the movement of warping of the ends of the aeroplane.

It will probably be generally conceded that the patent law was not intended to grant a monopoly on any *method* or *act* of this nature but was intended to go no further than to grant a monopoly upon a *mechanical combination*. This mechanical combination in the present case was so organized as to automatically practice said method, because it supplied a mechanical connection between the old vertical rudder and the old aeroplanes having parts relatively movable into different angles of incidence.

The gratitude of the public to the Wright brothers for their achievement would naturally be expected to result in the courts resolving in favor of the Wright brothers and their assignees any doubts which the judges might have as to the meaning of the Wright patent. The decisions on the preliminary injunctions, rendered so soon after the Wright brothers have demonstrated their achievement to the world, may reasonably be expected to have gone further in broadly interpreting the scope of said patent than the final decisions of the same judges are likely to go after the cases are more fully presented to them than could be done on the motions for preliminary injunctions.

To my mind the Wright patent will ultimately be construed to represent and define a very inconsiderable part of the achievement of the Wright brothers; that is: mechanical means, in their broadest sense, whereby an aeroplane, having a vertical rudder, has its ends so connected with said rudder by intermediate mechanism, that when the ends of the aeroplane are moved angularly with respect to the body of the aeroplane, the rudder will be "caused" to move toward the side of the aeroplane having the "smaller angle of incidence and offering the least resistance to the atmosphere."

The compensation of the Wright brothers for their main achievement—their method of flight—if they are to be fully compensated, must be similar to that which is received by scientists in other fields who make a great scientific discovery and who invent an instrument whereby they may put their discovery into practice and patent such instrument.

The monetary compensation to such discoverers is rarely commensurate with the value to the world of their discoveries. When many scientists are working to an end, they help each other to move toward the goal, and care must be taken that he who is the first to reach it does not interfere with the progress of the others in any channels in which they may have been working other than the channel chosen by him.

In a case like the present, great care should be exercised,—and naturally is exercised,—to interpret the monopoly of the inventor as covering all that his claim can possibly be construed to cover, without interpreting it so broadly as to define that which is not patentable.

In this instance, more than usual care is required not to overstep the line, in the enthusiasm for the victorious inventor, to such extent as to deprive the public of to-morrow of a single right to which it is entitled, and not to extend the monopoly beyond the terms of the patent which the inventor and the Patent Office, (the latter representing the public), agreed upon as the measure of that part of the inventor's achievement which is entitled to reward under the patent laws.

RECORDS AND STATISTICS

AIRCRAFT published last month a letter written to obtain further information concerning the validity of certain European performances mentioned or omitted from the lists published here, advices have now been received confirming the accuracy of these lists as presented, in every particular.

As the June issue went to press, cabled accounts reached this side of the great two-man flight made by Nicholas Kinet on May 15th, 2 hrs. 51' 10" was the time, which of course smashed the World's Record, a tabular history of which appeared here last month.

It will be noticed that the record beaten by Nicholas Kinet belonged to his brother Daniel; Nicholas was little or not known before this big flight; he piloted a Gnôme-driven Farman—a combination which holds practically every world's record to date.

Outside of this, most record-breaking performances of the month were made in cross-country flights the big birds are evidently growing weary of circling for hours over confined areas and are boldly leaving their aviaries to soar across country.

The first stage of Curtiss's flight down the Hudson—about 74 miles—constituted an American record for straightaway flight, and, were it not beaten this year, would win for him the Scientific American Trophy.

The world's cross-country record for a two-man flight again fell by the board on May 19th, when Cheuret (Farman-Gnôme) flew with Mme. Branger from Mourmelon to Chalons and back (45 miles).

To our list of men who have flown for an hour, should be added the name of Charles Hamilton, who made a flight of sixty-five minutes at San Diego early in the year. This brings the number up to forty-eight on April 30; since then the list has further lengthened as follows:

49.	De Lamine	1 hr. 05'	May 4,	1910
50.	Wachter	1 hr. 30'	" 8,	"
51.	Morane	1 hr. 05'	" 10,	"
52.	Martinet	1 hr. 45'	" 13,	"
53.	Etrich	1 hr. 18'	" 14,	"
54.	Tétard	1 hr. 48'	" 14,	"
55.	N. Kinet	2 hrs. 51' 10"	" 15,	"
56.	Cheuret	1 hr. 12'	" 19,	"
57.	Marconnet	1 hr. 30'	" 20,	"
58.	Bruneau de Laborie	1 hr.	" 23,	"
59.	Foulois	1 hr. 02' 30"	May 30,	1910
60.	Euler	1 hr. 19'	" 31,	"

In a few days it will be quite impossible to keep track of all those succeeding in flying for an hour at a stretch, and in future only two-hour flights can be dealt with with any degree of accuracy.

A list of all two-hour flights made to date is given: the numbers in the margin show the order in which the crack aviators performed the feat of remaining continuously above ground for that period.

Legagneux has been generally credited with making a two-hour flight at Lyons, but on investigation it appears that the flight fell a few minutes short of the mark.

We have been asked to publish a list of all hour-flights up to date, similar to that which we published recently, and which included all such flights up to December 31 last. This is no longer possible: an hour-flight by one of the better known flyers passes now unnoticed. we can, however, still give a list of all hour-flights as yet made *in America*, and append one herewith:

Flights Made to Date (June 1st) Exceeding Two Hours in Duration

Aviator	Time	Date	Machine	Motor	Place
1. Wilbur Wright	2 hrs. 20' 23" 1-5	December 31, 1908	Wright	Wright	Near Le Mans, France
2. Roger Sommer	2 hrs. 10'	August 4, 1909	Henry Farman	Vivinus	Mourmelon, "
"	2 hrs. 27' 15"	" 7, "	"	"	" "
3. Louis Paulhan	2 hrs. 43' 24" 4-5	" 25, "	Voisin	Gnôme	Near Reims, "
4. Hubert Latham	2 hrs. 17' 21" 2-5	" 26, "	Antoinette	Antoinette	" " "
5. Henry Farman	3 hrs. 15'	" 27, "	Henry Farman	Gnôme	" " "
6. Henri Rougier	2 hrs. 41' 36"	October 3, "	Voisin	E. N. V.	Near Berlin, Germany.
Louis Paulhan	2 hrs. 49' 20"	November 1, "	Henry Farman	Gnôme	Brooklands Track, England.
Henry Farman	4 hrs. 17' 53" 2-5	" 3, "	"	"	Mourmelon, France.
7. Léon Delagrange	2 hrs. 32'	December 30, "	Blériot	"	Juvisy, "
Henry Farman	2 hrs. 45'	" 31, "	Henry Farman	"	Mourmelon, "
8. Daniel Kinet	2 hrs. 19' 15" 2-5 *	April 8, 1910	"	"	" "
9. Jeannin	2 hrs. 01'	" 11, "	"	"	Near Berlin, Germany.
Louis Paulhan	3 hrs. — †	" 18, "	"	"	Orleans to Arcis, France
10. C. Grahame-White	2 hrs. 08' †	" 23, "	"	"	London to Rugby, England.
Louis Paulhan	2 hrs. 49' †	" 27, "	"	"	London to Litchfield, England.
11. C. Van den Born	2 hrs. 06' 41"	May 7, "	"	"	Lyons, France.
"	2 hrs. 03'	" 9, "	"	"	" "
12. Prince Popoff	2 hrs. 08' 10"	" 11, "	Wright	Wright	St. Petersburg, Russia
13. Captain Engelhard	2 hrs. 21' 45"	" 13, "	"	"	Near Berlin, Germany.
Jeannin	2 hrs. 39' 25"	" 11, "	Henry Farman	Gnôme	" " "
C. Van den Born	2 hrs. 03'	" 13, "	"	"	Lyons, France
14. Wachter	2 hrs. 02'	" 14, "	Antoinette	Antoinette	Mourmelon, France
15. Nicholas Kinet	2 hrs. 51' 10" *	" 15, "	Henry Farman	Gnôme	" "

* With a passenger. † Across country.

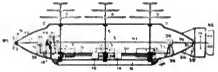
List of Hour-Flights Made in America

Aviator	Time	Date	Machine	Motor	Place
1. Orville Wright	1 hr. 2' 15"	September 9, 1908	Wright	Wright	Fort Myer, Va.
"	1 hr. 5' 52"	" 10, "	"	"	" "
"	1 hr. 10' 24"	" 11, "	"	"	" "
"	1 hr. 14' 20"	" 12, "	"	"	" "
"	1 hr. 20' 45"	July 20, 1909	"	"	" "
"	1 hr. 12' 40" ‡	" 27, "	"	"	" "
2. Lieut. Humphreys	1 hr. 01' 20" ‡	November 3, "	"	"	College Park, Md.
3. Louis Paulhan	1 hr. 58' 32" *	January 17, 1910	Farman	Gnôme	Near Los Angeles, Cal.
"	1 hr. 02' 42" 4-5 †	" 18, "	"	"	" " "
"	1 hr. 49' 40" 4-5	" 20, "	"	"	" " "
4. Glenn H. Curtiss	1 hr. 25' 05"	" 20, "	Herring Curtiss	Curtiss	" " "
5. Charles K. Hamilton	1 hr. 05' †	" 24, "	" "	"	San Diego, Cal. into Mex and back.
Glenn H. Curtiss	1 hr. 24' †	May 29, "	" "	"	Albany to Camelot, N. Y.
6. Lieut. Foulois	1 hr. 02' 30"	" 30, "	Wright	Wright	San Antonio, Tex.
Charles K. Hamilton	1 hr. 06' 15"	June 11, "	Herring-Curtiss	Curtiss	New York Harbor
"	1 hr. 47' 15" †	" 11, "	" "	"	New York to Philadelphia.
"	1 hr. 21' †	" 13, "	" "	"	Philadelphia to South Amboy, N. J.

* American record at this date (June 13). ‡ With a passenger. † Across country.

RECENT PATENTED INVENTIONS

Briefed by Gustave R. Thompson



U. S. PATENT 956,648

U. S. Patent 956,648. May 3, 1910. Henry C. Schanze, Sr.

A heavier-than-air craft sustained by propellers revolving on vertical shafts and propelled by propellers on horizontal shafts at front and rear; these latter shafts can be raised or lowered to bring about the ascent or descent of the helicopter.

U. S. Patent 954,215. April 5, 1910. Johannes Schilling.

This is a dirigible having an insulating covering to prevent fluctuations in temperature.

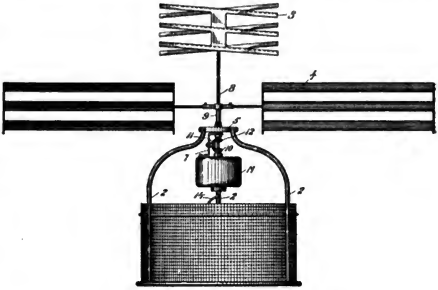
The gas-bag is surrounded by a jacket filled with an inert gas, such as nitrogen or the products of combustion.

U. S. Patent 954,574. April 12, 1910. Albert Koegler and Kamillo Stelzer, Jr.

A helicopter—to which a gas field support may be annexed if deemed necessary.

The two sustaining propellers revolve in opposite directions; the car is suspended to the upright shaft by a universal joint.

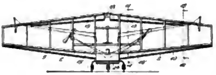
Steering is obtained by displacing the propellers from the horizontal by the aid of a rope.



U. S. PATENT 954,574

U. S. Patent 956,428. April 26, 1910. Nikolaus Rueben.

For a balloon-shed or hangar having a removable roof. The roof is made in a plurality of sections, each of which is mounted on a beam or rafter pivoted or hinged to the side wall. By turning the beams around on their pivots, or by turning them upward on their hinges, the top of the shed may be opened so as to allow a balloon to rise from within.



U. S. PATENT 957,744

U. S. Patent 957,744. May 10, 1910. William W. Christmas.

This is an aeroplane for which automatic stability is claimed, through the shape of the two supporting planes. The upper and lower planes converge toward one another at the ends; the upper plane has an opening in its median portion:—the front portions of this upper plane near the opening have a greater angle of incidence than the other parts, creating on the underside of the plane a current of air toward the center and up through the opening.

In addition to this steadying current there is created under the lower plane, by reason of its shape, a current of air toward the ends of the machine. This current opposes and neutralizes currents of air coming from the side.

The dihedral angle of this plane and the low center of gravity also contribute to automatic stability.

Some Construction Details

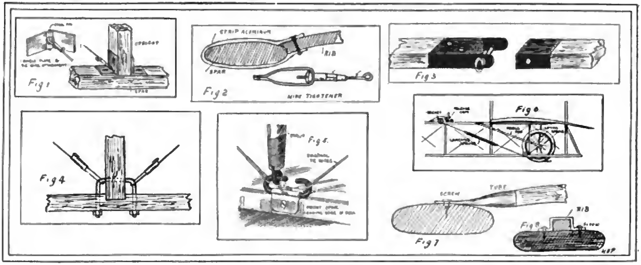


Fig. 1:—a joint used on the Macfie monoplane (England).

Fig. 2:—shows method of joining ribs to spars, used by Edick and Edwards on their biplane now at Mineola, and also a wire tightener used on this machine.

Fig. 3:—illustrates method of joining main spar-sections on the Short biplane (England).

Fig. 4:—a joint used on the Blériot monoplane.

Fig. 5:—accurate representation of the famous flexible joint used on Wright biplanes: this drawing was made from the Short-Wright in which Rolls recently performed the "Double Channel-Crossing."

Fig. 6:—Landing device on Short biplane, referred to on page 150 (British Aeronautic Notes, June AIRCRAFT).

Figs. 7 and 8 show methods of joining ribs to both front and rear spars. (Baldwin biplane).

We have the London magazines, "The Aero" and "Flight," to thank for several of the details shown here.

CLUB NEWS

Compiled by Ada Gibson

Pittsfield Aero Club

By Luke J. Minahan, President

This year's ballooning season in New England is expected to be a particularly busy one. In Pittsfield especially is the sport expected to surpass in activity that of preceding years. This city has been one of the main, if not the main ballooning centre of the United States during the last four years, the site and park having been pronounced without peer in the country by the Aero Club of America. Twenty-eight of New England's eighty-six ascensions were made from Pittsfield, and more would have been made but for the limited supply of gas.

This year, however, the gas supply will be unlimited, as the Pittsfield Gas Company has arranged to have a gas-holder of 250,000 cubic feet capacity set aside for storing, for the balloons, specially made gas of low specific gravity. The gas will thus be in constant readiness and the arrangement will enable aeronauts to make ascensions upon two hours' notice.

There has already been built a hangar for the storage of balloons, with lockers where balloons can be kept under padlock. The roomy loft of the same building has been turned into a workshop, where the big bags can be spread, dried and repaired.

These additions make Pittsfield an ideal ballooning station. Its splendid inducements to the balloonist are: Proper geographical situation, a good aeronautical park equipped with a proper balloon hangar, abundance of gas, and facilities for prompt and rapid inflation.

The Pittsfield Aero Club is one of the best known and most active clubs in America. The officers of the club are: President, Luke J. Minaham; Vice-President, H. C. Crafts; Secretary, Norman C. Hull; Treasurer, Harry E. Hughes. The Board of Directors are the officers mentioned plus Daniel England, Kelton B. Miller, Dr. S. S. Stowell and Harry A. Dunbar.

CLUB NOTES

The Harvard Aeronautical Society, after inspecting every available field in New England, has selected the race track grounds at Salem, N. H., for New England's first aviation meeting place. The event, is planned for August. The aeroplane flights will be held under the auspices of the Harvard Society, and the balloon flights under the management of the Aero Club of New England. Special train service will be arranged from Boston and New York, Salem being some 90 miles from Boston.

The sheds which have been built by the Rochester Aero Club for the use of its members are now finished, and already two of the club's inventors, C. H. Armson and William Gurnett, have established themselves in their new quarters, and are busily engaged in assembling their biplane.

A trophy costing approximately $2,500 has been offered by William Wrigley, Jr. The proposal has been made to Mr. James F. Plew, vice-president of the Aero Club of Illinois, through Mr. R. T. McLaughlin, who, if the offer is accepted, will design the trophy which is to be made in ebony, bronze, sterling silver, and marble, and is to be five to six feet in height.

It is understood that the trophy will be offered to the Aero Club of Illinois to be competed for under the auspices of the American Aeronautical Association.

The club winning this trophy will hold it subject to future competition. The terms governing the contest to be outlined by Mr. McLaughlin, Mr. James D. Plew, and the chairman of the Contest Committee of the Aero Club of Illinois.

The Aero Club of New England is considering action to secure the affiliation with it, probably as a parent club, of the twenty or thirty Aeronautical Societies now existing in New England. At present there is no connection between the Aero Club of New England which officially is associated with the Aero Club of America and thus a part of the general movement and the other organisations in its territory. Some few of the latter have secured recognition before the major association.

The Aero Club of New England expects to have an aeroplane this season, for W. Starling Burgess, of Marblehead, Mass., has offered to deliver one of his machines by July 15; according to agreement, it must have made a flight of half an hour's duration, and attained a speed of 33 miles per hour, before delivery to the club.

It is proposed to hold the first national aviation meet for novices ever held in this country at St. Louis from June 20 to 25. The meet will be held under the auspices of the Aero Club of St. Louis.

H. C. CRAFTS, VICE-PRESIDENT OF THE PITTSFIELD AERO CLUB

A course in the science and art of flying has been established at the Armour Institute of Technology, Chicago. Associate Professor Melville Baker Wells will give courses in aerodynamics and aeronautical construction; and Associate Professor Arthur M. Fruti will lecture on motors for flying machines. For several months some twenty students of the Armour Institute of Technology have been making experiments, and one of the seniors, Mr. A. Smith, of Chicago, is preparing a thesis on "Stresses in Aeroplane Frame Work." Dr. Gonsaulus, Dean Howard M. Raymond and the faculty are showing great enthusiasm, and expect to have the students build some forty or fifty machines during the courses next year.

With but few exceptions all the college clubs in the country have expressed themselves as being favorable to the Intercollegiate Aeronautical Association recently organized, and when present plans are put into action there will be every incentive to keep enthusiasm at a high pitch.

Circular letters have been sent to every college in the country calling their attention to the Association.

A printed booklet containing the constitution, etc., is being got out and plans for the ensuing year are well under way.

The University of Pennsylvania Aero Club held a very successful aero-show in connection with the University Settlement Carnival, on May 27 and 28.

Included in the exhibits were aeroplane models, balloon instruments, and the frame of the U. of P. aeroplane, which is being built by student members of the club.

A lecture on the Reims meet, illustrated with moving pictures, was given by Secretary George Atwell Richardson, who was in charge of the show, assisted by E. H. Dechant, E. P. Wright, J. P. Rhodes, A. W. Marriott, C. P. Mann, W. M. Moody, E. R. Walker, G. L. Knox, P. S. Weiser and C. A. Benjamin.

An exhibition of gliding, with the club's gliders, was much appreciated by the ten thousand present.

A meeting of representatives of various Aero Clubs and Societies identified with the recently organized Aeronautic Federation of America was held on June 2, at the headquarters of the Aeronautical Society, 1999 Broadway, New York, for the purpose of electing officers of the organization, and also members of a Convention Committee. The duty of this Committee will be to present a report at the National gathering which will be held jointly with the American Aeronautic Association the latter part of June.

Much discussion on different subjects pertaining to the organization took place previous to the election of the following officers:

President, Professor David Todd, Secretary and Treasurer, Thomas A. Hill. Among those elected as members of the organization and convention committee were: Clarence W. Mackay, Secretary of the Aero Club of Rochester; Dr. Thomas W. Carey, Jr., Secretary of the Southern Aero Club; Professor David Todd, of the Amherst Aero Club; Professor J. J. Montgomery, of Santa Clara College, Thomas E. Eldridge, President of the Philadelphia Aeronautical Society; Professor J. J. Green, of the Aero Club of Notre Dame; Dr. L. E. Custer, President of the Aero Club of Dayton; Dr. R. C. Northwood, President of the Aeronautic Alumni Association; F. H. Fethersonhaugh of the Aeronautical Society of Canada, George A. Richardson, representing fourteen university aero clubs, and President of the Intercollegiate Aeronautical Federation; F. W. Armstrong, Director of the Aero Club of California.

CHRISTENING OF BALLOON "MASSACHUSETTS," AT PITTSFIELD, BY MRS. L. J. MINAHAN

Thomas A. Hill, Director of the Aeronautical Society; F. A. Ayres, Secretary of the Aero Club of Utah; Clarence F. Fisher, Aeronautic Society of New Jersey; John M. Satterfield, President of the Aero Club of Buffalo; E. L. Jones, Aeronautical Society; Geoffrey W. Talbot, Secretary of the Tufts Aero Club; Henry M. Neely, Aero Club of Pennsylvania; J. Davenport Kerrison, Secretary of the Aero Club of Jacksonville; Oscar J. Needham, President of the International Dayton Aeroplane Club; E. H. Young, President of the Aero Scientific Club of Washington; Arnold Kruckman, Hudson Aero Club; W. E. Metzger, Vice-President of the Aero Club of Michigan; Wilbur R. Kimball, Instructor of the Young Men's Christian Association Aero Club, and J. M. Thomason, Aero Club of Missouri.

The American Aeronautic Association represents twelve American Aero Clubs, which makes a total of fifty-one clubs to be represented at the forthcoming convention; it is expected that many other aero societies will join in the movement, before that event takes place.

LUKE J. MINAHAN, PRESIDENT OF THE PITTSFIELD AERO CLUB

The Aero Club of Carnegie Technical Schools was organized last January by students of the three schools in Pittsfield, Mass., bearing that name. It has an active membership of sixty, and an associate membership of interested people of Pittsburg outside of the schools. A very successful exhibit of models was held in March; all of these were built by members, and many original ideas and much skillful workmanship was displayed in their construction. Two full-sized aeroplanes are being built by members, one by Wood, Slingerland and Bauman, while the other is being constructed by Chalfant and Butler. The students are furnishing the material for the machines and they are being built at workshops provided by the school.

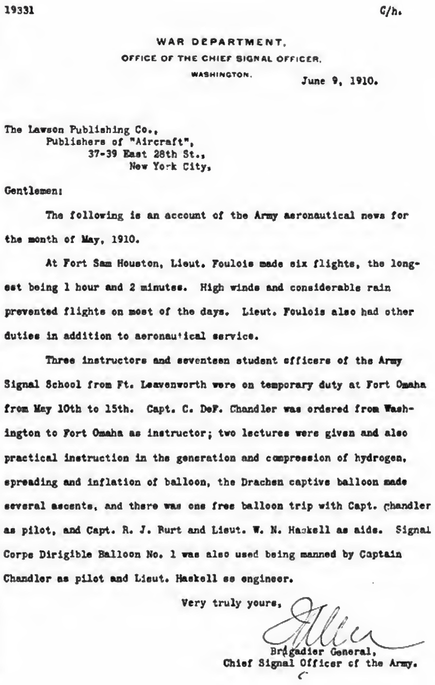
Some very successful flights have been made with gliders and much valuable information gained from experiments. The officers of the Club are: W. J. Vance, President; W. J. Bauman, Vice-President; W. B. Chalfant, Secretary; W. R. Rudolph, Treasurer.

The Peoria Aircraft Club is now a full-fledged aeronautic organization, licensed to hold races and contests under the auspices of the Aero Club of America, and to be governed by the rules of that organization. The affiliation papers by which the local club is made a part of the parent body have been received by President Eugene Brown, and preparations are already being made to increase the scope of the organization and to boost the balloon game during the coming season. The Club has decided to invest in a large balloon (85,000 cubic feet capacity). In short, Peoria is now on the aeronautic map to stay and promises to fly high in the future.

MILITARY NEWS OF THE MONTH

AS RECORDED BY

BRIGADIER GENERAL JAMES A. ALLEN



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WAR DEPARTMENT,
OFFICE OF THE CHIEF SIGNAL OFFICER,
WASHINGTON. June 9, 1910.

The Lawson Publishing Co.,
Publishers of "Aircraft",
37-39 East 28th St.,
New York City,

Gentlemen:

The following is an account of the Army aeronautical news for the month of May, 1910.

At Fort Sam Houston, Lieut. Foulois made six flights, the longest being 1 hour and 2 minutes. High winds and considerable rain prevented flights on most of the days. Lieut. Foulois also had other duties in addition to aeronautical service.

Three instructors and seventeen student officers of the Army Signal School from Ft. Leavenworth were on temporary duty at Fort Omaha from May 10th to 15th. Capt. C. DeF. Chandler was ordered from Washington to Fort Omaha as instructor; two lectures were given and also practical instruction in the generation and compression of hydrogen, spreading and inflation of balloon, the Drachen captive balloon made several ascents, and there was one free balloon trip with Capt. Chandler as pilot, and Capt. R. J. Burt and Lieut. W. N. Haskell as aids. Signal Corps Dirigible Balloon No. 1 was also used being manned by Captain Chandler as pilot and Lieut. Haskell as engineer.

Very truly yours,
Allen
Brigadier General,
Chief Signal Officer of the Army.

GENERAL NEWS

By Ada Gibson

As a direct result of Glenn Curtiss's great Albany-New York flight, a wave of enthusiasm for cross-country flights appears to have swept over the country, the tangible result of which is the donation of a series of large cash prizes for the performance of various city-to-city flights.

At the banquet tendered to Curtiss by the *New York World*, a prize of $30,000 was offered in competition by the *World* and the *St. Louis Dispatch*, for a flight between New York and St. Louis; and a prize of $25,000 was offered by the *New York Times* and the *Chicago Evening Post* for a flight between Chicago and New York.

The dates when these contests will be open for competition, and the conditions under which they can be won, have not been definitely settled at this writing. It has been suggested for the Chicago-New York flight that it be made from Chicago to New York, rather than in the other direction because the prevailing winds are western, and that anywhere from three to ten days be allowed the contestants wherein to cover the distance.

F. H. Wheeler of the Motor Speedway of In-

THE WITTEMANN BROTHERS OF STATEN ISLAND ON THE BIPLANE BUILT FOR C. W. MILLER

At the recent Aeronautical Exhibition held at San Francisco all the better known types of aeroplanes were shown, notably Curtiss, Farman, Wright and Bleriot machines.

George H. Loose's Santos-Dumont "Demoiselle" and Antoinette type monoplane also figured among the exhibits.

With the steadily increasing interest in air-craft, new aero motors are appearing all over the country. One which has recently been put on the market, and which is attracting a good deal of attention is the remarkably compact and businesslike little engine turned out by the Detroit Aeroplane Company. A power of from 20 to 30 h.p., a weight of 98 pounds and, last but not least, a price of $250 are certainly interesting figures to consider for the would-be aviator looking for the wherewithal to take his glider off the ground.

At Simms Station, near Dayton, where in 1904-05 the Wright brothers perfected their flyer, some very good flights have recently been made by Orville Wright. On one afternoon he made a height record for Wright machines, reaching 2,500 feet, according to all accounts, and later took up his father, for his first flight, and his brother Wilbur, on the first flight the two have ever made together.

Mr. Hugh Willoughby says he will devote the entire summer to aeroplane work. He has just started work on his "War Hawk," in which he attempted a flight last Fall, breaking the propeller shaft, since which time it has been in his aerodrome at Atlantic City. A new shaft is being made, which will be completed in about a week, and after Mr. Willoughby has finished fitting up the "War Hawk," he will complete the 95-pound machine (the "Pelican") which he started building last Winter in his home-made aerodrome at his Florida residence, at Sewall's Point.

dianapolis has announced the donation of $5,000 in gold on behalf of a local manufacturing company, as a prize to the first aviator who succeeds in flying from the Motor Speedway to the city limits of Chicago. The Washington Board of Trade on June 3 appointed a committee to confer with the Chamber of Commerce regarding plans for raising a fund of $20,000 for a flight between New York and Washington. It was suggested that organizations of New York, Philadelphia, Baltimore and Washington contribute to the fund.

On June 1, Governor Hadley, of St. Louis, and John H. Curran, Commissioner of Immigration, Missouri, started a fund which is expected to reach $10,000, the amount of which is to be awarded to the aviator who shall fly from St. Louis to Kansas City—a distance of 288 miles—in 24 hours.

As this magazine goes to press Charles Hamilton is about to undertake a flight from New York to Philadelphia and back, under the auspices of the *New York Times*, and W. F. Willard and J. C. Mars, two other well-known Herring-Curtiss aviators, are to battle for a $2,000 purse in a match race from Topeka to Kansas City.

We publish on these pages photographs of the biplane which the Staten Island, N. Y., constructors, C. & A. Wittemann, have recently shipped to Charles W. Miller of Chicago. The latter will be well remembered by those who followed the doings of the famous professional wheelmen during the palmy days of bicycling and bicycle racing, as a winner of several six-day races. His name was for many years a by-word, as a synonym of almost superhuman endurance.

At a time when the endurance of aeroplane motors is beginning to exceed that of their drivers, his entrance into the field of professional flying is significant. If he has retained the physical qualities which twelve years ago made him less impressionable to fatigue than any cyclist of his day, he should be able, when once he has learned to fly, to pilot an aeroplane from the sunrise to the sunset of a Winter's day, and to create records for duration which would take a lot of beating.

The machine which the enterprising young builders of Staten Island have turned out for Miller is a biplane of the Voisin type with certain features suggestive of the successful Curtiss machines. It has no lateral control outside of the vertical surfaces joining the main planes which, however, are counted on to go far toward giving it automatic stability. It has a biplane tail with a single vertical rudder affixed to its rear. It is trussed with steel cable galvanized to prevent rusting, and fastened to turnbuckles, and specially designed eyebolts. The power plant comprises a [illegible] h.p. Whitehead motor from which they have good reason to expect a large degree of efficiency.

The engine is of the improved two-cycle type, with [illegible] port exhausts to each cylinder. No carburetors are used, special Whitehead vaporizers being provided, one for each cylinder. Each cylinder is thus a complete working motor in itself.

The intake is automatic, and is through a valve located in the center of the piston head. The crank-case is divided into four compartments which serve as pre-compression chambers and in which the gas is compressed to twenty pounds per square inch previous to being admitted into the explosion chamber.

When the exhaust takes place, the relief of the pressure in the explosion chamber enables the lower pressure in the crank case to force the valve open, admitting the new charge into the explosion chamber coincident with the escape of the dead gases through the exhaust-ports.

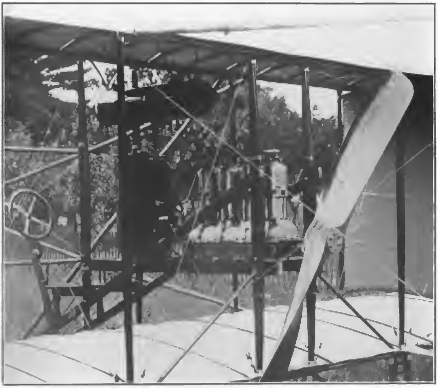
On the upward stroke a compression of 95 pounds is reached, resulting in increased power. The exploding charge is at 300 pounds per square inch.

The bore is 5 inches and the stroke 5½ inches.

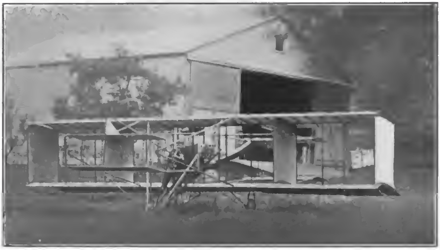
A. J. Myers, Inc., of New York, are now the sole owners of the U. S. Patent rights in the Grouvelle & Arquembourg carburettors, well-known on this side of the Atlantic as the G. & A.

This firm has seriously entered the aerial field; it deems that where absolute automatic carburation is so necessary it should have a great field before it.

The difficulty of regulating the gas mixture to suit speed, altitude, temperature, humidity, etc., is so great that some of the very biggest firms have entirely discarded carburettors for aero engines. It is a somewhat debatable question whether they would have done so had they had at their disposal carburettors of such remarkable efficiency as some of those turned out now-a-days.



THE POWER PLANT OF THE MILLER BIPLANE: A FOUR-CYLINDER WHITEHEAD MOTOR



THE MILLER BIPLANE READY TO TAKE THE AIR

Mr. Harris K. Rich, a real estate man of Lynn, Mass., has invented an helicoplane which embodies many original features.

Curtiss, Willard and Mars are booked to fly at Minneapolis in the latter part of June. More aeroplane contests will be held at Minneapolis during September.

Good progress has been made at the flying school at Montgomery, Ala. W. R. Brookins and Arch. Hoxsey made several nocturnal flights on May 25-26.

The St. Louis National Aero Show is to take place in the Coliseum from October 8 to 13, during the aeroplane meet which will last from October 5 to 17. We will have occasion to refer again to both show and meet: they promise to attract universal attention.

Several men are busy in the vicinity of New Orleans, in the construction of air-craft.

Mr. Levy of that city, has completed several models of various dimensions and has had some success.

Two young business men have been working in their leisure hours on the construction of a ten-foot model monoplane, for which they claim many innovations.

Others have been experimenting with Malay kites, and on one occasion, at night, when a large fire-ball was attached to one of the kites, that part of the negro population who witnessed it fell upon their knees and implored that they be delivered from "de comet."

Dr. A. Rudolph Silverstone, of Milwaukee, announces his intention of organizing Aero Clubs throughout the Middle West wherever the community shows sufficient interest to warrant the effort, and of paying the initial expenses of incorporation. He has organized three such clubs so far and hopes in the near future to perfect plans to form a sort of State League in Kenosha, Racine and Oshkosh.

Mr. J. F. Scott, of Chicago, who some time ago made a short flight with an aeroplane at Lawrenceburg, Ind., has completed a machine of entirely new design which he will try out shortly.

NEW COMPANIES

The Marquette Aeroplane Company, of Indianapolis, has been incorporated with a capital stock of $10,000 to manufacture aeroplanes. The directors of the company are: Melvin A. Marquette, Jesse A. Johnson, and Frank A. Lauck.

The Philadelphia Motordrome Association has been incorporated at Trenton, N. J., with an authorized capital of $2,000,000. The company is empowered to conduct aviation contests on its motordrome. The incorporators are: F. H. Hansell, George H. B. Martin, and Kohn A. MacPeak, all of Camden, N. J.

The Rinek Aero Manufacturing Company, of Phillipsburg, N. J., was recently incorporated with capital stock of $40,000. The incorporators are: Howard Rinek, C. Norvin Rinek, and Frank R. Ruckman, of Easton, Pa.; William B. Martin, of Bethlehem, Pa.; Sylvester C. Smith, Phillipsburg, N. J.

The Aeroplane Manufacturing Company, of Boston, has been incorporated with a capital of $25,000 for the manufacture and sale of aeroplanes: Pres., William H. Hillard, of Boston; treasurer and clerk, W. Ernest Timson, of Lynn. Attorney, C. F. Dutch, of Boston.

Frank Bettman, Arthur Langguth and P. A. Taylor are the incorporators of the Portland Aeroplane Company, with a capital stock of $5,000.

Who is the youngest person in the world to have made a balloon trip? Robert Thaxter Farmer claims the honor: he was but three years of age when he rose last September in Carl E. Meyers' balloon at Worcester.

For accuracy's sake, however, and at the risk of disappointing fond parents, we feel bound to mention that the world's record in this line—an unbeatable record—is held by a certain Mr. Godson of England, who, some twenty-one years ago was born in a balloon-car a few thousand feet above Mother Earth!

Wright Injunctions Dismissed

On June 14th the United States Circuit Court of Appeals handed down a unanimous decision vacating the preliminary injunctions granted on behalf of the Wright Company against the Herring-Curtiss Company and Louis Paulhan, pending the trial of the suits.

It is hard to overestimate the far-reaching effect of this decision on aeroplane construction and competition in this country, at this time, for it will be many months before the suit itself will come up for decision, and in the meanwhile builders, flyers and promoters will feel that they have little to fear from the Wright Company.

In their decision the Judges call attention first to the fact that the Wright patents have never been adjudicated, otherwise than on the motion for the temporary injunctions issued pendente lite, and then go on to say:

"In this record upon the question of fact there is a sharp conflict of evidence, numerous affidavits testifying. All their statements are ex parte, made without any opportunity to test their probative force under cross examination. Under such circumstances, it seems to us, irrespective of any other questions in the case, that infringement was not so clearly established as to justify a preliminary injunction. The order is reversed, with costs."

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OPEN FOR WOMEN.—On Mondays and Fridays from 10 A.M. to 10 P.M. On Tuesdays, Wednesdays and Thursdays, 10 A.M. to 6 P.M.
OPEN FOR MEN.—At all hours of the day or night (except as above). Sleeping accommodation for 500 (men only). On Saturdays and Sundays, and all public holidays, Baths open to men only.

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COOPERATION WANTED

HAVING developed a totally new device for automatically balancing and steering aerial crafts, I wish to cooperate with a party, willing to furnish a few hundred dollars for building and demonstrating the same in a flying craft of any make.

This apparatus embodies principles and features of the highest importance and value and will become fundamental and indispensable to aerial navigation; its superior qualities are so convincing, as to make persons perplexed at first inspection.

Leading features of the apparatus:

Size 10"x10"x20" balances the largest craft, be it Wright, Curtiss, Bleriot, any dirigible, etc.

Possesses a positive, *nonoscillatable*, vertical (fundamental requirement) controller at all times that is perfect, and will never and can never be radically changed or improved upon.

Relieves the operator of all the attention at present given to balancing aerial machines.

Balances flying machines with their planes in tilted, warped, ascending, descending positions with utmost accuracy.

All steering mechanism combined in one hand-wheel.

Flying in horizontal, ascending, descending directions, circular, spiral curves of any radius by predetermined action on this one hand wheel without ever interrupting the automatic balancing operations.

Embodies practical functions of a statoscope.

Patents applied for in several countries. An early demonstration of this invention, presented here without exaggeration, is the principal motive for advertising it. Address:

G. GAWLET, 2318 Sixth Avenue,
Seattle, Wash.

I HAVE invented an air machine which I claim solves the problem; if the gas escapes the machine will keep on flying and cannot turn over or upset.

The inventor will give any company or club plans for development and then have shares of its earnings. Write for full particulars to Jno. McDonald, Jr., Point Prim, P. E. I., Canada.

AVIATION-INVENTOR and experimenter, twenty years' practical experience, desires backer. New principle aeroplane—start and alight direct from ground—any speed. Compact—stable—positive success. Address: W. D. C., Care of Aircraft.

HAVE NEW MONOPLANE, no freak but a sane Langley-type machine, with absolutely new steering and balancing mechanism. Want $1,500 for construction of a machine. Offer interest in patents. John G. Hanna, Box 55, Union Sta., Austin, Tex.

ELECTRICAL Gyroscope and aluminum aeroplane inventor desires financier for its construction. I claim projection in my invention, possibility of overturning in mid-air will be eliminated, ribs are invisible, resistance completely eliminated. For particulars address August S. Praube, 2516 Woodbrook Ave., Baltimore, Md.

THE FUTURE FLYING MACHINE. This wonderful machine is automatically balanced in the air, it does away with the warping of the wings or tips, is operated by one steering wheel and is driven by two propellers which derive their power from a 50-h. p. revolving cylinder motor. Its wings have a spread of 30 ft. and are 27 feet in length. The simplicity of this machine does away with accidents and makes it very easy for anyone to operate. I wish to form a company of one or more to manufacture this machine. If you are interested, address Ralph Cole, Norwalk, Ohio.

I HAVE designed a flying machine which combines an aeroplane and helicopter. This machine will rise straight up in the air without a running start; the planes being turned edgewise offer little resistance in the air when raising and when the desired height is reached they are pitched forward, thus sustaining the weight of the machine. The propellers are thus pitched forward and used exclusively for driving the machine ahead. From results obtained from several small models I think it will make a great success. I would like to communicate with a gentleman of money who would like to finance the building of a large one. Address J. W. B., care of AIRCRAFT, 37 E. 28th Street, New York.

WANTED.—Capital for manufacturing Monoplane. New principle. Perfect equilibrium and control. Leaves ground easily. Different from any type now in use. Moses Franklin, Grand Junction, Colorado.

FOR SALE

FOR SALE—Five dirigible balloons, 10,000 to 100,000 capacity. Four Spherical balloons, 40,000 to 78,000 capacity. All new and in perfect condition. Sell reasonable. G. L. BUMBAUGH, Indianapolis, Ind.

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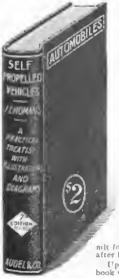

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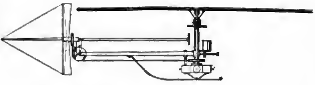

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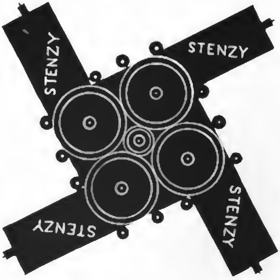

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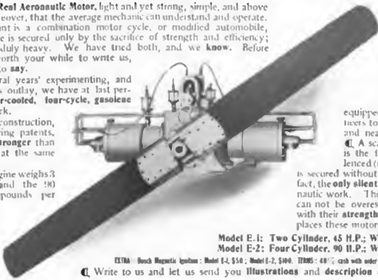

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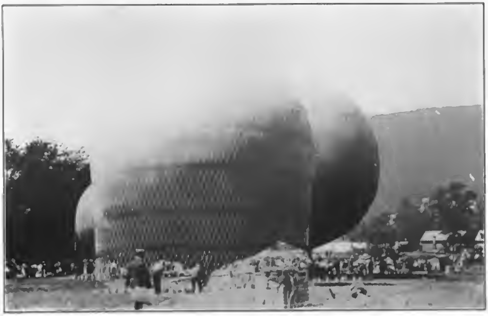

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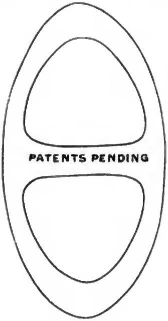

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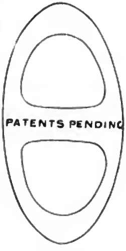

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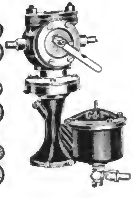

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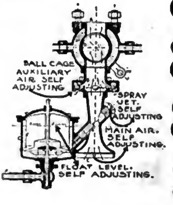
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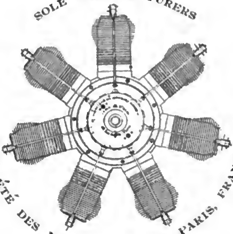

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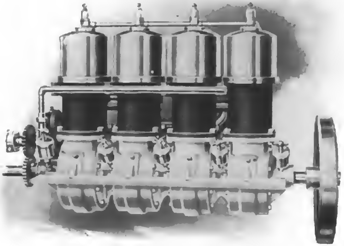

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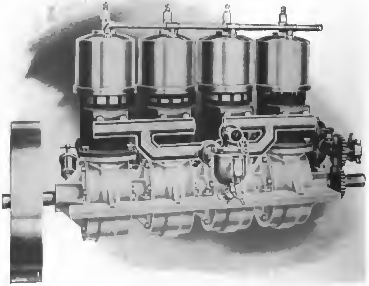

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AIRCRAFT

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SUMMARY OF HUMAN FLIGHT

By Mrs. J. Herbert Sinclair

(Continued from the June Aircraft.*)*

RATHER than discourage experimenters, the tragic end of Severo and of de Bradsky in 1902, appeared to stimulate them to further efforts and the very year in which these catastrophies occurred was to witness the ascent of the first of the great French dirigibles of the modern type.

As far back as 1899 the Lebaudy brothers had commissioned a well-known engineer, named Julliot, to make investigations into the design of dirigible balloons. The actual work of construction was taken in hand in 1901 by Julliot and the aeronaut, Surcouf, and the first ascent made in the fall of 1902.

This airship was of a new type; the cigar-shaped bag of 80,000 cubic feet (187 feet long by 32 feet diameter) was fastened to a rigid elliptical keel-shaped floor which was intended to prevent the rolling and pitching during the voyage. The total weight, including 1500 pounds of gasoline, water, and ballast, was two and a half tons. The motor was a 35-40 h.p. Mercedes weighing 829 pounds without water or fuel; there were two two-bladed nine-foot propellers placed on either side of the car and giving 353 pounds pull at 1056 revolutions. The dirigible was known as "Le Jaune" because of the bright yellow German cloth the bag was made of. Altogether some thirty experimental ascents were made, improvements being made continuously in the details of construction; the longest trip was one of two hours and forty-six minutes during which 61 miles were covered.

On November 21, 1903, "Le Jaune" came into contact with a tree on landing, tore open and burst. The motor being uninjured, the dirigible was immediately rebuilt and was ready again for trial in October, 1904; the reconstructed airship also made some thirty trips until it was again torn by a tree on landing, after a voyage of over three hours. This occurred on July 6th, 1905, at Mourmelon, now so well known as an aviation center.

The Lebaudy dirigible was again repaired in all haste and by the end of September was once more ready to ascend; several most successful trips were made before it was dismantled for the winter.

These experiments may be said to have been the starting point of the present aeronautical activity in continental military circles; the Lebaudys' balloon was, in fact, the first of all military dirigibles. It took up altogether 195 passengers, on different occasions, among them the French Minister of War. The lighting arrangements for night travel were most complete. They comprised an acetylene searchlight of one million candle-power and two lamps of one hundred candle-power each, which lighted the car and the lower side of the balloon, while each passenger carried a small lamp which was fastened to his clothes.

A dirigible of the same semi-rigid type as the La Jaune was purchased from the Lebaudy brothers by the French Government, which, save in a few details, was a duplicate of the La Jaune. The same unsymmetrical form was retained, but the volume of the new airship was increased by 200 cubic meters. A motor of 70 horse power was installed as against the La Jaune's 40 horse power, and two projecting elevating planes were fixed to the front of the horizontal stabilizing framework.

This magnificent craft, which was christened the Patrie, far excelled any other airship that up to the time had ever been constructed; but its life was destined to be short, for a few days after it so successfully journeyed from Paris to Verdune in seven hours, which event was accomplished on November 23, 1907, it was caught in a gale, and while trying to land, was, despite the efforts of hundreds of soldiers, carried away by the wind across the Channel, passing over England, and after dropping souvenirs in the shape of pieces of its machinery into many little English towns, only ended its wild flight by "landing" in the North Sea, where the huge bag, still inflated, was found a few days later.

The "Republique," which also met with disaster just a year ago, was the second dirigible to be built for the French Government, though not the second to be owned by them, for this was the Ville-de-Paris, which was built for Henry Deutsch de la Meurthe who, immediately after the catastrophe to the Patrie, offered it to the Minister of War.

It will be remembered that the lamentable and fatal disaster to the "Republique" occurred last September, when on its return journey to Chalais-Meudon, after having taken part in the military manoeuvres at La Pallisse, and was caused through the breaking of one of its propellers, a piece of which pierced the gas bag, and the dirigible fell to the ground. The crew, consisting of four men, all being instantly killed.

The car of the dirigible Ville-de-Paris, which was a construction of metal tubing lattice work, had two rudders attached to it; one for steering laterally and the other for ascending and descending. A two-bladed propeller, six meters in diameter, was driven by a 70 horsepower motor at 900 revolution per minute; the screw, placed at the front of the airship, made, through a reducing gear, 180 revolutions per minute.

It was on January 15, 1908, that the Ville-de-Paris sailed under its own power from Paris to Verdun, to replace the wrecked Patrie.

It was also in this very same airship that the great scientific explorer, the Prince of Monaco, who has surveyed and sounded the ocean, received the "baptism of the air."

(To be continued in October Aircraft.*)*

LAW AND THE AIR

By Denys P. Myers

(Continued from August AIRCRAFT.)

CONTRABAND BY AIR-CRAFT

THE conflict still goes merrily on as to what will be the actual uses of aircraft, commercially or for State purposes; and in all the talk very few of the military experts and other experts have injected imagination, the all-essential in considering the conquest of the air at this stage. I wrote last spring that the nations would probably find it convenient to keep foreign air-craft some 1,500 yards above their territory; now Brookins rises 500 yards beyond that with ease. Last year a non-stop journey of 100 miles in air called forth columns of cable dispatches and comment; on July 9 and 10 the duration record was thrice broken, each time with flights above 200 miles. Happily there is no war, else what I am going to write would be antedated before it is printed. And the part that applies to peace can remain speculative only a short time.

However, contraband trade and its peaceful prototype, smuggling, are important features to consider. No existing border at present is worth anything as protection against hostile or felonious air-craft and in this respect they will continue to decrease in value. Customs houses, roadsteads, port regulations, all the complicated paraphernalia to collect duties and prevent undesirable or unlawful importations or exportations, have fallen below par when viewed from the coign of vantage of the air.

Already we are negotiating with Mexico to provide against smuggling by the aerial route across the border and the International Aerial Conference, which met at Paris on May 28, adjourned on the last day of June until October, in order to study the problems it confronted in this respect more at length.

Contraband, describing roughly those articles which one belligerent desires to keep from its opponent because of their possible value to him in waging the conflict, is particularly a seaborn traffic. For no State sells abroad more than its surplus and, in general, its sea-borne traffic represents simply this surplus. So it is not surprising to learn that the London Naval Conference, which signed its declaration February 26, 1909, considered air-craft among contraband articles. The conferees divided goods according to custom, into absolute contraband, conditional contraband, and not contraband at all. Article 24 of the Convention says:

> The following articles, susceptible of use in war as well as for purposes of peace, may, without notice (de plein droit), be treated as contraband of war, under the name of conditional contraband:
>
> * * * *
>
> (8) Balloons and flying machines and their distinctive component parts, together with accessories and articles recognizable as intended for use in connection with balloons and flying machines.

The Conference was participated in by Germany, the United States, Austria-Hungary, Spain, France, Great Britain, Italy, Japan, the Netherlands and Russia, the principal naval powers. Although the United States has not yet signed the Declaration, so far as known, the failure to do so has been due to a constitutional technicality rather than displeasure with the terms of it. Therefore, the above statement may be accepted as the law of the United States.

The article is clear and precise enough when its terms are understood, and it will be seen that it by no means lays down a hard and fast rule. Another name for conditional contraband is "articles of ambiguous use," and that term indicates the uncertainty always present in their consideration. So that it will be found that air-craft in the next war will be captured in cargo and deemed immune from capture in a manner at first bewildering to the aviator who has property at stake.

But the belligerents will operate under definite rules, and the basis of their action will be the destination of the goods. Not necessarily all air-craft consigned to a belligerent port will be subject to capture, nor all that are carried in the vessels belonging to nationals of one or the other belligerent. On the other hand, not all air-craft consigned to neutral ports, even if carried in neutral ships, will escape scot free. And the reason for immunity or lack of it will always be found to lie in the question of what is the ultimate destination.

Modern theory has it that only States are ever at war and that their individual citizens are entitled to as little inconvenience as possible from the conflict, either in their business or pleasure. Therefore, in the near future, when racing air-craft shall have assumed as distinct a form as the racing automobile now has, it will be quite probable that provision will be made for placing them in the list of articles not subject to contraband seizure. Obviously, such a rule would scarcely apply to their component parts, for with the constant tendency to manufacture machinery of an interchangeable nature or on standard gauges, parts would generally be useful for war purposes, even though the complete machine might be held to be exempt. Developments toward the time when this consideration will have force are already evident, both Hamilton and the Wrights having under construction machines especially designed for racing purposes. And it may also result that other distinctive types will be designed, as distinct as the present automobile trucks, that might equally escape the prohibition of contraband, because of unfitness for war.

A very interesting consideration also arises in applying the so-called doctrine of continuous voyage to air-craft. This is an American theory, developed during the Civil War, and is to the effect that a vessel ostensibly bound to a neutral port might be seized during any part of her voyage if suspected of contraband intentions. It was the practice of British shipowners to fit out vessels with cargoes for the Confederacy and consign them to Cuba or Mexican ports just across the line from Texas, thinking thus to minimize the likelihood of capture and trusting to get the goods to the enemy with ease from such convenient intermediate ports. Time and again such attempts were frustrated by capture, and the ships and cargoes usually condemned. The doctrine has in great part been softened, it now being accepted that the vessel is not liable to capture for suspicion of contraband dealings until after it leaves the intermediate port.

Here is a situation of which air-craft will be able to take advantage both in peace and war. Probably it is worth more in peace now that communication is easy by wireless, for few things of value in military operations, except information, are light enough to be easily carried on air-craft as we now conceive them. But a couple dozen of Parisian gowns or a hundred yards of the finest lace would not weigh more than a man and could be carried through the air. Suppose such a bundle is brought to Montreal and there billed regularly by the air route to Hemmingford, Quebec, a town almost on the New York line. What is to prevent the aviator from sneaking across the border, flying low at a preconcerted point, dropping off the bundle in the yard of a confederate, lighting by chance near the customs station of that vicinity and securing a clean bill from the officers. Meantime the confederate could ship the goods to New York City by whatever route he pleased and they would be none the worse after a little pressing out of wrinkles.

There is smuggling for you. False trunk bottoms and gastronomic tricks of swallowing diamonds cannot compare with that as a sport or a safe method of breaking law. Major Baden-Powell says air-craft will spell the doom of tariffs.* They will certainly have an effect on them so far as some schedules are concerned, and this statement particularly applies to light goods of great value or goods possible of being transported in small compass. But air-craft as a means of transportation do not necessarily spell the doom of tariffs, or anything else. They will work changes, and a more likely one, it seems to me, than dooming tariffs, to make the whole world a free trade emporium, would be to equalize duties. If, for instance, Canada admitted silk wearing apparel at 10 or 15 per cent. *ad valorem* where the United States taxes it 60 per cent. a profitable smuggling trade might be built up. But if both agreed on a duty, say 40 per cent., an importer might as well bill the goods to New York as Montreal in the first place.

So there are three possibilities regarding smuggling: abolition of all duties, equalization of them, or making all possible precautions to prevent smuggling through the air. The latter alternative is the most likely, for it can scarcely be doubted that a large municipal fleet of air-craft will be found necessary, corresponding to revenue cutters, lighthouse tenders and other vessels now in the public service. Add to such a fleet the installation of an isolated zone of safety, and there is a complete system of customs inspection. Time alone can tell whether it will prevail.

Fauchille, the chief advocate of this latter project, says:

Art. 13.—The aerostats (or aeroplanes), intending to land, coming in the zone of protection, shall be the object of a customs inspection by the public balloons (or aeroplanes) of the territorial state. These balloons (or aeroplanes) will inform themselves of the contents of the manifest as well as of the place and time of landing; they shall transmit by signals to the authorities of the earth this information with the indications relative to the identity of the aerostats (or aeroplanes) met.

These aerostats (or aeroplanes) will be the object of a detailed search on the ground.

Public aerostats (or aeroplanes) escape in principle the preceding dispositions.

Smuggling is a crime by statute. It seems probable that the statute will be revised to make special provision for attempts against the fiscal régime of the country by fixing a particularly harsh penalty for smuggling by air-craft. Such a change, coupled with Fauchille's project, revised to suit the legislator's taste, would undoubtedly furnish all that is necessary in the way of protection. For it is a good deal to presume that the nations are going to abolish all customs or reduce them to a dead level just because man has taken to the air.

(*To be continued in October* AIRCRAFT)

AFTER RHEIMS

By G. F. Campbell Wood

IF the great Rheims Aviation Meeting of 1909 was epoch-making as the sudden revelation to the world at large of the future of flying, that of 1910 was no less sensational in its demonstration of the tremendous progress made by aviation in Europe in the intervening ten months.

As a drawing attraction the ordinary flying meet will, it would seem, soon cease to have the "succès de curiosité" which it at present enjoys through its very novelty, and may very shortly be almost entirely replaced by cross-country competitions, but it is only by such tournaments as that of Rheims that the actual progress of the art can be accurately gauged from year to year, and it is evidently the intention in France to make the "Rheims Week" the yearly classic in the sport of flying—at least for Europe.

The remarkable results obtained show that all the previous meetings of the year including such fine international competitions as those of Heliopolis, Cannes, Nice, Biarritz, Lyons, Tours, Buda-Pest, Angers and Rouen were merely preliminary to and only "led up" to the "Grande Semaine de Champagne."

Practically every world's record was beaten there in many cases several times and on consecutive days, and the end of the "Week" revealed an entirely new set of names and figures on the record lists.

Outside of this general impression of progress the most salient feature at Rheims this year was the triumph of the monoplanes over the biplanes. This was not wholly unexpected, for at Buda-Pest and at Rouen the single-plane machines had more than held their own and shown that their main handicap in previous meetings had lain in the inadequacy of their motor power to carry them to victory; it is doubtful, however, if even the most sanguine advocate of the monoplane expected such a clean sweep as that made by the Blériots and Antoinettes, to say nothing of the newer monoplanes: the Hanriots, the Nieuports, the de Pischoff.

The Officers' prize and the Ladies' prize were the only ones carried off by biplanes, and in neither competition did monoplanes compete.

It is true that in cross-country flying, biplanes still hold the lead (even the fine raids of Dubonnet's Tellier monoplane falling short of Curtiss', Hamilton's, Paulhan's and Grahame-White's town-to-town flights). It is also true that Brookins has flown higher than any monoplane driver, that Roger Sommer's compact little biplane has carried more passengers than any single plane machine has as yet, and that if the official "two-man" record belongs to Aubrun's Blériot, both the Kinets have actually flown with a passenger on their Henry Farman's for many minutes longer than he, but taking the results all in all, it may be said that the monoplanes have suddenly leaped to the front as equal to the biplanes in endurance and stability and far superior to them in speed.

Speed was, in fact, the dominant note at Rheims and the real surprise of this year's meeting.

A good deal had been heard in the last six months of aeroplanes flying at sixty miles an hour, the claim having notably been made in favor of Santos-Dumont "Demoiselles" and of Maurice Farman, Curtiss and Voisin (of the new type) biplanes, but nothing like such speed had been officially recorded before Rheims, in fact nothing greater than fifty-two or three miles an hour—and it was with astonishment that the news was received of the velocity at which the latest Blériots flew at the big French meeting.

The careful and painstaking experiments which the great Frenchman and his lieutenant—Alfred Leblanc—had been making for the last few months certainly bore their fruit at Rheims and the true possibilities of the latest flat-plane Gnôme-driven Blériots were revealed.

To Americans these results are of peculiar interest as the Blériot looms up as the logical favorite in the coming "Gordon Bennett Cup" race and the machine most likely to carry away the coveted trophy, across the Atlantic.

Nor can Leblanc's time in the French eliminatories be taken in any way as a criterion of what the cup defenders "have to beat." Not only was this time (1 hr. 19' 13 3-5" for the 100 kilometers), which was made on a 50-h.p. Blériot, substantially reduced, but by identical machines later in the week (Olieslaegers finally turning the trick in 1 hr. 8' 1"), but Morane showed what could be expected of the 100-h.p., 14-cylinder Gnôme-Blériot, when he circled the five-kilometer track on the last day, in the astounding time of 2' 48 2-5"—about 66¼ miles an hour. It does not take much perspicacity to foresee that by the time the cup race comes off Blériot will have got this latest speed marvel in condition to travel an hour at this speed, and will, if necessary, use one in the cup race—in which case it is fifty-six minutes instead of seventy-nine that the defenders will have to beat to be returned the winners!

Nor are the other members of the French team to be despised as Latham and Labouchère with their magnificent Antoinette showed a speed about equal to that of the eight-cylinder Curtisses, and proved that Levavasseur's famous featherweight engine has at last acquired that reliability it has so long lacked, and is now capable of menacing the supremacy of the wonderful Gnôme (which it actually beat in three of the most important contests: the team, longest official flight and height prizes).

There is no need to touch upon the records established at Rheims, which are referred to at length in "Records and Statistics" of this issue, or on the exact results of the meetings which figure in "Foreign News," other figures in connection with the monster aerial tournament may not be without interest, however.

The entries numbered *seventy-six*—thirty-one monoplanes, forty-five biplanes, thirteen of the former were Blériots and six Antoinettes, whilst fifteen of the biplanes were Henry Farmans and nine were Sommers.

The largest and heaviest biplane was Lieutenant Féquant's big military Henry Farman (44' 3" spread, 44' 11" length, 592 square feet surface, 1,320 lbs. weight); the smallest and lightest was Ladougne's Goupy, which actually captured the 10-kilometer record for a two-man flight with 8' 14 2-5" (19' 8" spread, 22' length, 237 square feet surface, 660 lbs. weight).

Among the monoplanes the Antoinettes were, of course, the largest and heaviest (49' 2" spread, 39' 4" length, 377 square feet surface, 1,150 lbs. weight), while the wonderful little Nieuports were the smallest and lightest (27' 7" spread, 22' length, 151 square feet surface, 500 lbs. weight). There were no really diminutive machines such as the Vendômes or Santos-Dumont "Demoiselles" entered, neither were there any such monsters in heavier-than-air craft present as the Cody biplane.

The Nieuports were the only machines to rely on automatic stability for lateral balance with the exception of Madame de Laroche's Voisin of the old vertical-partition type; all the others had warping wings or ailerons.

Every machine at Rheims was mounted on wheels—even the four Wrights entered by the Comte de Lambert, René Gasnier and Captain Etévé being fitted with them; a great many had, of course, skids as well (Henry Farman, Sommer, Wright, Sanchez-Besa, Goupy, Savary, Hanriot, Nieuport, de Pischoff).

The Sommers and the Wrights were the only ones not to have regular shock-absorbers (rubber, pneumatic or springs).

As regards motors, thirty-five of the entries—or nearly half—had Gnômes, two of which (one on Morane's record-breaker and the other on one of Henry Farman's racers) being the new 14-cylinder 100-h.p. engines, while nineteen machines had E.N.V.'s among them one of De Mumm's Antoinettes; the other Antoinettes had engines of their own make and the remaining entries favored Darracq, French Wright, Panhard, Gregoire-Gyp, Clerget, Labor-Picker and the new five-cylinder Anzani motors; de Baeder's Wolseley engine was not ready for Rheims, while among good French motors which were missed there were Renault, Dutheil and Chalmers and Bayard-Clement.

About three-fifths of the propellers used were Chauvières, although ten other makes were represented, the Antoinette and Voisin products being the only metal ones present.

As was to be expected with such a tremendous entry list and with an aerodrome one-half the length of last year's, the course was pretty crowded in calm weather, as many as eighteen machines being seen in flight at once; a good many accidents occurred and nearly all of them were attributable to this overcrowding, biplanes and monoplanes continually encountering each other's airwash to their mutual peril. There seems little doubt that Mme. de Laroche's lamentable fall was caused by this, although with four machines flying almost together little blame could be attached to that one responsible for blowing down ("soufler," according to French aviation-slang) another flyer.

The one calamity to occur—the fatal fall of Wachter's Antoinette—was, however, in no way due to "crowding"; either the fabric, soaked with rain, or the main stays, gave way when flying downwards and the wings doubled up.

The other Antoinette pilots immediately changed the cloth of their wings and doubled the stays and no further accident of this kind was recorded throughout the week.

IMITATING THE BIRD'S WING

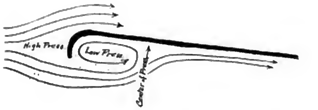
By William Fyfe Turnbull

MUCH has been written to convince aviators that just as success in land transportation has come about through the adoption of mechanical principles, other than those involved in the running of the horse, so likewise will air transportation be achieved through departing from the mechanical principles of bird flight. Carried away by this thought, aviators have overlooked one point in the structure of the bird wing, which, if more closely followed, would make possible greater stability and speed in the navigation of the air.

During the winter of 1906-07 the writer, in co-operation with Mr. Gilbert Small, of Waltham, Mass., conducted a series of laboratory experiments at the Massachusetts Institute of Technology with a view to ascertaining what form of surface was most stable in a current of air and gave the greatest lift in proportion to its head resistance. The surfaces tested included flat surfaces, circular and parabolic arcs of various degrees of convexity, hook-shaped curves and others resembling the letter "S" elongated. Without going into details, it may be stated that the most satisfactory shape of surface turned out to be one with a slight hook at the front edge and flat in the rear. (See diagram.) After the actual tests were completed, we came across a series of cuts showing the cross-section of the wings of different birds and were a good deal surprised to note that our most satisfactory surface was nearly an exact trace of the gull's wing, whereas a curve similar to that used on prevailing types of aeroplanes resembled the wing of a pigeon.

Now the gull is known to excel in sailing flight as opposed to flapping, and the coincidence above mentioned led us to believe that an important reason for this is that the front edge of its wing is *not tangent* to the direction of flight (as most aeroplane surfaces now are) but, on the contrary, is *almost perpendicular* to it, thus combing up the air as the bird sails along and forming a whirl or eddy back of the advancing edge.

The attention of scientists was first called to this principle



Air stream about hook shaped plane

almost twenty years ago by Laurence Hargrave, of Australia, inventor of the Hargrave box kite. It has, however, been ignored in so far as can be judged from the subsequent literature and practice of aviation. A partial explanation of the principle was obtained by accurately determining the direction of the air stream lines at a great number of points surrounding the surface and also measuring the pressure of the air at these points in comparison with that of the main current. The condition of affairs then disclosed is illustrated by the diagram. The hook of the front edge prevents the bow wave from increasing the pressure at any point of the front third of the surface. Ahead of the center of pressure the air is naturally traveling toward the front edge. In the case of a flat surface or a circular arc this air would curl around the front edge and form part of the so-called bow wave. But in this case the hook prevents its escape and turns it backward, producing a cyclonic effect, with a field of very low pressure in the center of the rapidly revolving eddy. The reaction of this air in moving away from the hook together with the effort of the air in the rear to fill up the center of low pressure produces a forward force which materially decreases the total head resistance. In addition the whirl of air referred to in some way improves the stability.

The writer further believes that the under surface of main planes in air machines should be made rough instead of smooth, so as to break up the wicked cross-currents much as the stepped spill-way of a dam breaks up the mass of falling water. The theory of gliding over the air like grease is an illusion. The aviator in a wind is rather like a skater with dull skates who cannot glide because he slithers and slips and fails to cut the ice. In observing aeroplanes in flight at present nothing is more noticeable than a certain "crawfish effect" as though the machine could not grip the air, but slid about over it, keeping headway only by dint of maintaining great speed.

NEW FLYERS DESCRIBED

THE BURLINGAME MONOPLANE

By W. H. Phipps

AN interesting monoplane which has arrived at Mineola is that constructed by Mr. Elmer Burlingame of Boston. The machine is a miniature copy of the one exhibited by Mr. Burlingame at the Boston Aero Show in February, and is, perhaps, the smallest monoplane in this country.

The Burlingame aeroplane is interesting as an entirely home-made machine, and also because it embodies many new and ingenious details in its construction. As a type it resembles a combination of the Demoiselle, Antoinette and Blériot machines. Dimensions and details of construction follow:

WINGS

The wings or planes are each 10 feet long and have a chord of 5 feet. They are of the usual monoplane type, built up of ten double ribs over two transverse spars, and are covered both top and bottom. They are trussed to the frame with steel cable wire, forming a perfectly rigid supporting surface.

FUSELAGE

The fuselage is entirely unique in design. It consists of four main members each 18 feet long, trussed and joined as shown in the diagram. The operator's seat is placed above and behind the motor and is supported on the top spars of the frame.

THE TAIL

The tail is the most interesting part of this flyer and is the subject of a patent. It consists of two separate small planes each 5 feet by 4, which are capable of being operated separately or together, thus fulfilling the purpose of elevator and ailerons in one.

THE VERTICAL RUDDER

The vertical rudder is placed at the rear of the fuselage, between the tail planes. It measures 4 feet by 3 and is double surfaced.

RUNNING GEAR

This consists of two Blériot type shock-absorbing wheels and a long skid, which runs two-thirds the length of the machine and curves up in front to protect the propeller.

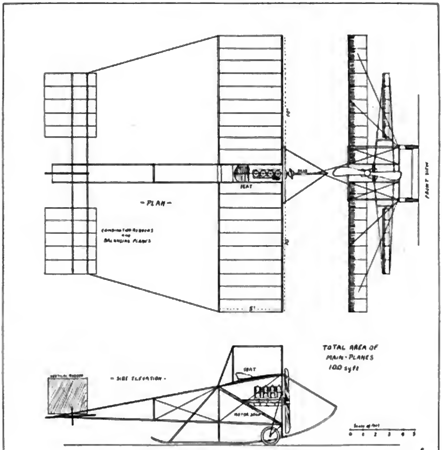
PROPULSION

This is furnished by a 30-h.p. four-cylinder Harriman water-cooled motor, driving direct a 5-foot laminated Burlingame propeller of high pitch.

MISCELLANEOUS

Piano wire has been used for trussing, steel cable being used only for control wires. Steel tubing is used wherever a rigid truss has been thought advisable.

The monoplane was built at Boston and brought to Mineola, where it is now undergoing trials.



BURLINGAME MONOPLANE

BIG MEN OF THE MOVEMENT

Gage E. Tarbell

ANOTHER prominent man to take an active interest in the development of aviation in America is Gage E. Tarbell of New York.

While Mr. Tarbell was one of the early members of the Aero Club of America, still it was not until recently that he began to attract general attention through his activities as a promoter of the sport.

When the Aero Club of America first began to look about for a general manager of the International Aviation Meet, to be held in October, it was Gage E. Tarbell who was decided upon as the best available man for the position. At that time it was understood that the Meet would be held at Garden City, but later, when the location was changed to Belmont Park Mr. Tarbell resigned.

One great work, however, that Mr. Tarbell has already accomplished for the good of aviation in America, and Eastern aviators in particular, was the converting of the vast Hempstead Plains of Long Island into one of the very best aviation fields in the world.

Gage E. Tarbell was born on a farm, situated on the flats of Smithville, Chenango County, New York, on September 20, 1856, and from his very earliest days exhibited an extraordinary aptitude for business.

After graduating from the collegiate department of the Clinton Liberal Institute and then teaching school for a year, he took up the study of law, and in 1880 was admitted to the bar in Ithaca, which profession he followed for four years.

During this time he conducted as a side line enough life insurance business to convince him that he could make more money as an insurance agent than as a lawyer, and finally decided to connect himself with the Equitable Life Assurance Society.

In 1891 he was made resident secretary of the Equitable in Chicago, with direct control of its affairs in Illinois, Wisconsin, and northern Michigan.

He was called to New York in 1893 by the then president of the Equitable as third vice-president of the society.

Mr. Tarbell is a great athlete and especially fond of golf, billiards and horseback riding, but his great weakness, if such it can be called, is farming; his happiest days are those he spends on the old farm, where he was born, and which, after it came into his possession, he remodeled and improved to such an extent that to-day it is one of the most up-to-date farms to be found in the country.

Mr. Tarbell is a member of the Aero Club of America, Automobile Club of America, Union League Club, Ardsley Club and many others; and is noted for his after-dinner speeches.

Clement Ader

CLEMENT ADER is a name which will in the ages to come be forever known as that of the man who first succeeded in so far overcoming the laws of gravity as to lift himself above the earth by mechanical means. It can well be argued that the short jumps which Ader's great bats accomplished in the closing years of the last century were not real flights, and that to the Wright brothers belongs the distinction of being the first men to actually fly. Ader cannot be robbed, however, of the great prestige as a pioneer to which his partially successful experiments of the solving of the problem of flight entitle him.

The life of this great scientist is an admirable example of unity of purpose and intelligently applied perseverence. Born in the spring of 1841, Clement Ader showed early signs of the mechanical genius which was to make him one of the great figures of modern scientific research.

Although he had always been deeply interested in the mystery of flight and its possible solution by mechanical means, it was the great French tragedy of 1870—the Franco-Prussian War—which turned his thoughts earnestly in this direction. In building a flying machine it was mainly patriotism which prompted Ader, kindled his enthusiasm, and maintained his perseverance. It was to be many years, however, before he built a full-sized machine which he was actually satisfied to test.

His protracted experiments extended over many years, and cost a vast sum of money, but on October 9, 1890, in the grounds of the Chateau of Armainvilliers, a great bat-like creature made of metal and rubber-cloth and propelled by a steam-engine of wonderful design was drawn along the ground by the pull of its four-bladed propeller, and at a certain point was noticed by the two witnesses—Messrs. Vallier and Espinosa—to have entirely severed contact with the earth, only resuming it 150 feet further on.

The machine was the famous "Eole," and it was the first time in the history of the world that a machine heavier-than-air and carrying a man had risen from the surface of the earth into its atmosphere.

A year later the same machine, slightly modified, left the ground for over 300 feet, and six years after that the Avion III, with its two engines and two propellers, made two flights or jumps, the second one being 1,000 feet.

This is the share that Clement Ader contributed to the science of aviation. He did not produce a machine which could fly, and those who wish can accordingly look upon his work as a failure. It is, nevertheless, a fact that he contributed largely to the solution of the problem, and various features of his invention, such as his "curve of sustentation," and his warping wings, were embodied in the machines built subsequently.

Sir Hiram Maxim

AMONG many other notable distinctions, that of having designed and built the first full-sized power-driven flying machine in the British Isles belongs to Sir Hiram Maxim.

It was fifty years ago and at the age of sixteen that Mr. Maxim first became interested in the problem of artificial flight. Since then he has persistently studied the subject, both theoretically and practically.

It was about twenty-one years ago that Mr. Maxim started on the experiments which resulted in that colossal construction which he built at Bablywn Park, Kent, England, and with which nearly everyone is more or less familiar. This machine which was designed on a remarkably large scale was fitted with a steam engine which could be made to develop 350 horsepower and turn propellers 18 feet in diameter.

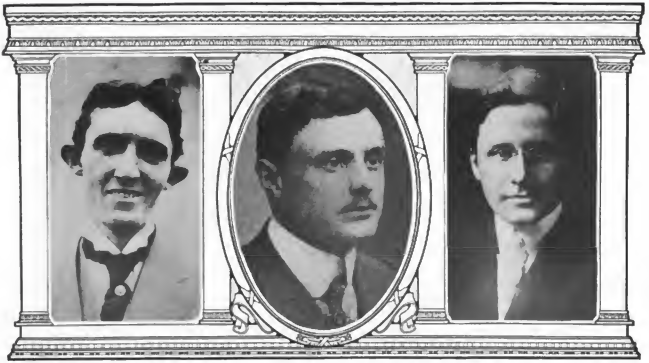
For the purpose of experimenting, this machine was fitted with wheels to run on rails; a third overhead rail was also run a few inches above the top of the machine to prevent its getting away when the engine was running; during one of the tests the machine rose from the lower rails—an historical moment—and the lifting power was so great that the top rail broke under the pressure; the machine fell over, clear of the tracks, and was practically destroyed.

Fifteen years later (a little over a year ago), after carefully reviewing the whole subject as it stood up to date, Sir Hiram, who in the interval had been knighted, decided to carry out in a second machine the same principals embodied in his first. He decided on certain modifications and on building it on a very much smaller scale; of course, a gasoline motor replaced the steam engine of 1894.

The engine which Maxim has designed for this machine has four cylinders, each five inches in diameter with 5 5-8 stroke, all of the vital parts of which are made of "Vickers" special steel, which is probable the strongest steel for weight that has yet been produced. He is also using an entirely new system of oiling, and three propellers, the third propeller taking the place of the fly-wheel on the engine.

Notwithstanding his English title and associations, Sir Hiram is an American by birth. He is at present a member of the well-known firm of Vickers' Sons and Maxim—perhaps he is best known as the inventor of an automatic system of firearms; he sold this invention to the English Government, after having offered it to his own country, and in recognition of his services was knighted in 1901.

A great figure among latterday inventors and pioneers of modern invention he has, unlike so many others, lived to reap the benefits of his scientific genius and to see many of his dreams, even those of the most utopian kind, materialize.



BIG MEN OF THE MOVEMENT

Charles Keeney Hamilton

CHARLES KEENEY HAMILTON—one of the greatest aviators in the world—was born on May 2, 1881, in New Britain, Conn.

His first practical experience in aeronautics occurred when he was a very young boy and tried to imitate a country fair parachute jumper by descending from one of the upper windows of his home by the aid of an umbrella. In these days he was the *Peck's Bad Boy* of the little Connecticut town in which he was reared.

Differing with his father as to his vocation in life, when he reached the age of twenty-one, he did what many other young men have done before him, and left his Connecticut home to follow his own inclinations.

In 1904 he became associated with Mr. Israel Ludlow and assisted him in his experimental work; and when in 1905 Mr. Ludlow built a number of full-sized aeroplanes in order to study the equilibrium and other unsolved problems of the heavier-than-air machine, it was Charles K. Hamilton who steered these aeroplanes, which were towed either by an automobile or a motor boat in their flights.

Mr. Hamilton also accompanied Mr. Ludlow to Florida when in 1906 he went South to make some further aeronautical experiments, and while there he made several towed flights in connection with the automobile races which were held on the beach.

Later on he became interested in the dirigible balloon, and as an operator of such, quickly became famous. He toured Japan with his dirigible and made considerable money from his performances, and on the same day that Blériot flew across the English Channel, Hamilton made a second dirigible flight across the Bay of Osaki.

It was Bleriot's cross-channel feat which determined Hamilton to take up the heavier-than-air machine, and the month following his return from Japan—last November—saw him making record flights in a Curtiss machine and within a very short time he electrified the world with his remarkable performances.

Then followed in rapid succession his great flights in the West, at Governors Island, and at Mineola, where the people of New York first saw him make the famous Hamilton dives, and his New York to Philadelphia flight on June 13, in which he established two new world's records and one American, it being the first return journey ever made between two big cities on the same day. It was also the first flight ever made to scheduled time and the longest cross-country flight ever made in the United States at that date.

For daring and skill in the manipulation of an aeroplane, this rough rider of the sky has no superior.

Charles Stewart Rolls

To the memory of the Hon. C. S. Rolls belongs many honors. He was the first British subject to cross the English Channel in a heavier-than-air machine; the first aviator to fly from England to France; the first to make the return journey; the first to fly across the Channel in a biplane, and, most lamentable fact, the first British aviator to forfeit his life in the interests of the new art.

The Hon. Charles Stewart Rolls was the third son of Lord and Lady Llangattock. He was born in London, August 27, 1876, and received his earlier education at Eaton, after which he entered Trinity College, Cambridge.

Few men were perhaps better known in both English and European sporting circles than the Hon. C. S. Rolls. Like so many other pioneer aviators, Mr. Rolls was for many years closely associated with the automobile industry; he was with Mr. Royce, the inventor of the Rolls-Royce automobile engine which bears that name.

In 1900 Mr. Rolls was the successful competitor in the one-thousand-mile automobile endurance run, which secured for him the gold medal. Five years later, in 1905, he drove as the representative of Great Britain in the International Automobile Race for the Gordon Bennett Cup; he several times broke the world's record for speed.

In the first Gordon Bennett Balloon Race of 1906 he won the special endurance prize given by the Aero Club of France, and was one of seven contestants who successfully crossed the Channel by night and reached their destination, a point in Norfolk, England.

Mr. Rolls won the £50 prize for making the first circular mile flight on the Royal Aero Club Grounds; the Salomon's hundred guinea trophy, and the English Aero Club's £25 short flight prize. He made his first notable flight on December 1 of last year when he flew 64 miles in 55 minutes. His Dover-Calais-Dover feat of a few months ago marks a distinct epoch in the history of aviation.

He was the founder of the Aero Club of the United Kingdom, and a founder member of the Automobile Club of Great Britain, and also captain of the London section of the Army Motor Reserves.

A more practical scientific worker than the late Hon. Charles Stewart Rolls would be hard to find, and the real depth of the loss of his assistance to the progress of aviation in England can only be properly appreciated and missed by those who worked with him. For many reasons his place can never quite be filled by anyone else.

It was on Tuesday, July 12, the second day of the first International Aviation Meet ever held in England, that Rolls made his last flight; and it was the breaking of the rear horizontal rudder of the machine he was using that robbed England of her foremost aviator.

Alfred R. Shrigley

ALFRED R. SHRIGLEY, secretary of the Aero Club of New England since its organization in 1897, was one of the first men in this country to place his faith in the future of aeronautics. For about thirteen years his interest in the conquest of the air has continued and the club he was instrumental in starting the first to be started in America, by the way—has grown from a membership of a very few to a prosperous organization with a long waiting list.

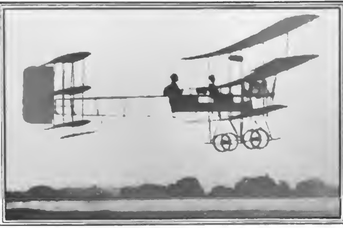
The services of the Aero Club of New England to the science of flight so far has been chiefly in ballooning, but it is giving aid and encouragement to many experimenters and a crop of aeroplanes is promised in the near future. Mr. Shrigley as the cleric of the club is in constant correspondence with many of these ambitious, although embryonic, bird-men, and the fund of information at his disposal is always at their disposal. He is also interested at present in setting up a formal scheme of affiliation between the Aero Club of New England, which is, in turn, affiliated with the Aero Club of America, and the many local organizations throughout his territory. This would place the science and its devotees upon a recognized basis, enable the co-ordination of experimentation and strengthen interest, which has already advanced to such an extent that one Boston paper for nearly a year has been conducting a weekly department of aeronautics.

Mr. Shrigley is a Boston lawyer and a pioneer automobilist, by which route he had his interest in aeronautics excited. He was born in Chile, South America, although he received his education in Boston and has practised law for over fifteen years. He, with a few others, decided as early as 1896 that an aeronautic club to promote experimentation and foster interest in what they believed to be the coming pastime and commercial means of locomotion was desirable. So they tested the idea among Boston automobile enthusiasts and received enough encouragement to call a meeting.

At the appointed time twenty-one persons got together to form the club, which was considered as a joke among their friends and by the newspapers.

The club made steady but not remarkable headway until about three years ago, when interest in aerial affairs began to grow acute all over the country. Since then a full-fledged air-craft show was given in Boston last February, while more and more attention is being given to aviation as opposed to aerostatics.

Mr. Shrigley has had much to do with these advances, and has noted with especial interest that the membership of his club has grown until its prescribed limit of 100 has been reached, and there is a respectable waiting list calling for revision of the limit upward.



FOREIGN NEWS

A. V. ROE CARRYING A PASSENGER ON HIS NEW STYLE TRIPLANE.

Belgium

Goffaux, who has been experimenting with a flexible wing monoplane, has announced his intention of flying from Ostend to London.

On August 1st, the Aviator Tyck rose to a height of 5,510 feet at the Brussels aviation meet. At the same meet Olieslaegers reached a height of 4,001 feet in his Blériot monoplane.

Bulgaria

The first flying ever seen here was Osmont's flights in his Farman at Sofia last month.

Canada

Count Jacques de Lesseps continued to give exhibition flights before leaving for France. He made some wonderful flights at Toronto.

China

A Canton engineer has just asked the Viceroy for permission to establish an aviation field in the neighborhood of the town.

England

In the August AIRCRAFT, under the heading of "Late News by Cable," we published a short but incomplete account of the Bournemouth aviation meet. For the benefit of those who take more than a casual interest in aviation we publish below the results of the meet. For a more detailed account of the meet see "European Letter," on page 259.

RESULTS OF THE BOURNEMOUTH MEET HEIGHT PRIZES

		Feet.
1	L. Morane (Blériot)	4,107
2	A. Drexel (Blériot)	2,490
3	C. Grahame-White (H. Farman)	1,660

DISTANCE FLIGHT

		Miles	Hrs.	Min	Sec.
1	C. Grahame-White (Farman)	90	2	34	56
2	J. Christiaens (Farman)	85	2	20	54
3	C. Audemars (Demoiselle)	17	—	27	17

SEA FLIGHT

L. Morane (Blériot) 23' 12 2-5"; speed, 50 m.p.h.

A. Drexel (Blériot) 35' 28"; speed, 35½ m.p.h.

C. Grahame-White (Farman) 35' 47"; speed, 27.44 m.p.h.

SPEED.—Five Circuits (Eight miles, 1,620 Yds.)

	Miles.	Sec.	Speed.
L. Morane (Blériot)	9	34 2-5	55.90
C. Audemars (Demoiselle)	11	30	46.54
L. Wagner (Hanriot)	12	12 1-5	43.87
A. Drexel (Blériot)	13	12 2-5	40.52

FASTEST LAP

L. Morane (Blériot)	1	53 3-5	56.64

ALIGHTING

Second and third prizes divided: C. Grahame-White (Farman); J. Christiaens (Farman); Hon. C. S. Rolls (French Wright); Capt. Dickson (Farman).

Mr. A. V. Roe continued to make good flights on his interesting little triplane at Brooklands. On July 9 he made a flight of 14 minutes, which constitutes a record for triplanes. He has since gained his pilot's license.

On July 12, the British army airship "Beta" journeyed from Farnborough to London and return. The trip lasted 3¾ hours, during which the airship covered about eighty miles.

Scotland is to have an aviation meet at Lanark from August 6 to 13. Prizes amounting to $40,000 have been offered, and in view of present prospects the meet promises in every way to be a success.

Robert Loraine, the actor-aviator, made a fine flight on August 1. Starting at 5 P.M. from Blackpool, he flew to Liverpool, crossing the Mersey, where he passed over an ocean liner.

A. V. Roe, who recently has been making excellent flights on his latest machine, experienced a piece of very hard luck on the first day of the Blackpool meeting, his machine being reduced to cinders before it was unpacked, through the case catching fire from the spark of a passing engine. At the same time Cecil Grace's Gnome-Blériot monoplane was also consumed; the latter was the machine on which Morane did his great flying at Bournemouth.

France

SUMMARY OF THE CHIEF RESULTS OF THE RHEIMS MEETING

GRAND PRIX DE CHAMPAGNE (50,000 francs), TEAM PRIZE

		Kiloms.
1	Antoinette	2,601
2	Blériot	2,303
3	H. Farman	1,902
4	Sommer	1,269

PRIZE FOR THE LONGEST FLIGHT (20,000, 5,000, 3,000, 2,000 francs)

		H.	M.	S.
1	Labouchère (Antoinette), 340 kiloms	4	37	0 2-5
2	Olieslaegers (Blériot), 225 kiloms	2	55	5 1-5
3	Tetard (H. Farman), 185 kiloms	—		
4	Cattaneo (Blériot), 180 kiloms	—		

GORDON-BENNETT ELIMINATING TRIALS

		H.	M.	S.
1	Leblanc (Blériot), 100 kiloms	1	19	13 3-5
2	Latham (Antoinette), 100 kiloms	1	24	58 3-5
3	Labouchère (Antoinette), 100 kiloms	1	25	24

HEIGHT PRIZE (10,000 and 5,000 francs)

		Metres.
1	Latham (Antoinette)	1,384
2	Chavez (Blériot)	1,150
3	Morane (Blériot)	750
4	De Baeder (H. Farman)	494
5	Cattaneo (Blériot)	410
6	Tetard (H. Farman)	403
7	Lindpaintner (Sommer)	345
8	Wagner (Hanriot)	203
9	Nieuport (Nieuport)	91

MILITARY OFFICERS' PRIZE (2,500 and 2,500 francs)

		M.	S.
1	Lieut. Cammerman (H. Farman), 50 kiloms.	46	50
2	Lieut. Fequant (H. Farman), 50 kiloms.	47	40

AUDEMARS FLYING A SANTOS DUMONT DEMOISELLE WITH WHICH HE MADE SUCH SPLENDID RECORDS AT THE BOURNEMOUTH MEET.

DE PISCHOFF PILOTING A WERNER MONOPLANE AT RHEIMS

LADIES' PRIZE (5,000 francs)

1 Baronne de Laroche (Voisin)....... 5 kiloms.

PASSENGER PRIZE (5,000 francs), WITH ONE PASSENGER

	H.	*M.*	*S.*
1 Aubrun (Blériot), 137.125 kiloms..	2	9	7 4 5

WITH TWO PASSENGERS

1 Mamet (Blériot), 92.750 kiloms.... —

SPEED PRIZE (10,000, 3,000, 2,000 francs), 20 kiloms.

	M.	*S.*
1 Morane (Blériot), speed = 106.508 k.p.h.	12	45 3·5
2 Leblanc (Blériot)	12	55 4·5
3 Olieslaegers (Blériot)	13	15

10 KILOMS.

	M.	*S.*
1 Morane (Blériot)	5	42 2·5
2 Labouchère (Antoinette)	6	31
3 Leblanc (Blériot)	6	33

5 KILOMS.

	M.	*S.*
1 Morane (Blériot)	2	48 2·5

MICHEL EPHRUSSI PRIZE (10,000 francs)

	M.	*S.*
1 Leblanc (Blériot)	19	14 1·5
2 Wagner (Hanriot)	20	57 4·5
3 Nieuport (Nieuport)	23	22 3·5
4 Pischoff (Werner)	24	46 1·5
5 Lindpaintner (Sommer)	25	51 1·5
6 Hanriot (Hanriot)	26	35
7 Aubrun (Blériot)	29	34 2·5

MICHELIN CUP (20,000 francs)

	H.	*M.*	*S.*
1 Olieslaegers (Blériot, Gnôme motor), 392.750 kiloms.	5	3	5 1·5

World's record for distance and duration.

HEIGHT TOTALIZATION PRIZE (3,000, 1,500, 500 francs)

	Metres.
1 Latham (Antoinette)	8,093
2 De Baeder (H. Farman)	6,460
3 Morane (Blériot)	4,336
4 Chavez (Blériot)	2,217
5 Cattaneo (Blériot)	1,162
6 Tétard (H. Farman)	900
7 Lindpaintner (Sommer)	651
8 Wagner (Hanriot)	566
9 Nieuport (Nieuport)	228

DISTANCE TOTALIZATION PRIZE (15,000, 8,000, 4,000, 3,000 francs)

	Kiloms.
1 Olieslaegers (Blériot), 10h. 11' 45"	1,603
2 Weymann (H. Farman)	1,254.56
3 Fischer (H. Farman)	1,160.52
4 Labouchère (Antoinette)	1,154.25
5 Latham (Antoinette)	926.5
6 Legagneux (Sommer)	873
7 Thomas (Antoinette)	860.25
8 N. Kinet (H. Farman)	677.655
9 Cattaneo (Blériot)	595
10 Lindpaintner (Sommer)	539.25
11 Hanriot (Hanriot)	539
12 Efimoff (Sommer)	341.5
13 Wagner (Hanriot)	315
14 Bouvier (Sommer)	314
15 Aubrun (Blériot)	313
16 Tetard (H. Farman)	292.115
17 Wagner (Hanriot)	290
18 Van den Born (H. Farman)	154.5
19 Dailleus (Sommer)	153.625
20 Ladougne (Goupy)	144.675
21 Wachter (Antoinette)	147.625
22 Martinet (H. Farman)	135.65
23 Leblanc (Blériot)	110
24 Bunau-Varilla (Voisin)	100.25
25 Pischoff (Werner)	70
26 De Baeder (H. Farman)	65
27 Morane (Blériot, 100-h.p. Gnôme)	50.25
28 Christiaens (H. Farman)	50.25
29 Bathiat (Breguet)	50
30 Colliex (Voisin)	45
31 Nieuport (Nieuport)	35
32 De Petrowski (Sommer)	30
33 Crochon (Sommer)	25.25
34 Verstraeten (Sommer)	25
35 Alfred Frey (H. Farman)	25
36 Andre Frey (Sommer)	25
37 Morane (Blériot)	25
38 Cheuret (H. Farman)	20
39 De Mumm (Antoinette)	14.625
40 Metrot (Voisin)	10.25
41 Raymonde de Laroche (Voisin)	5
42 Balsan (Blériot)	5
43 Noel (Blériot)	5
44 Chavez (H. Farman)	5
45 Deletang (Nieuport)	5
46 Pecquet (Sanchez-Besa)	5

OLIESLAEGERS, THE PRESENT WORLD'S LONG DISTANCE CHAMPION AVIATOR

The four Hanriot monoplanes seen at Rheims were all fitted with different motors, No. 1 with a four-cylinder Darracq; No. 2 with a Clerget; No. 3 with a Labor-Picker; and No. 4 with a Gyp. The Nieuport monoplanes were fitted with the new Anzani five-cylinder, air-cooled motors; Molon's Blériot also carries one of these now.

On July 7, Gaubert fell into the Allier, near Vichy, on his Wright biplane; nothing worse than a ducking was the result, however.

Eugene Renaux is the latest automobile racing-man to take up flying; he drives a Maurice Farman and has already made lengthy flights.

Madame de Laroche, injured at Rheims, is recovering rapidly; on the other hand, Madame Yves, the wife of the secretary of the Farman brothers, died from the results of an automobile accident on July 12. This sad occurrence took place in the mad rush back from Rheims, on the Paris road, at the close of the big meeting.

Two more aviators have flown over Paris: Champel on his Voisin, when he went from Juvisy to Sartrouville on July 13 (50 kilometres in 45 minutes); and Busson, who, the very next day (the French national holiday) re-edited on his Blériot the Comte de Lambert's feat of last October by flying from Juvisy to the Eiffel Tower and back; he took about ten minutes less time than the famous Russian. Champel's motor was an E.N.V. and Busson's a Labor-Picker. It will be remembered that the other machines which have flown over the French capital were propelled; the one (de Lambert's Wright) by a Barriquand & Marre Wright engine, and the other (Dubonnet's Tellier) by a four-cylinder Panhard.

Mounting his Henry Farman machine, Lieut. Fequent, on July 12, flew from Vincennes to Issy. When he arrived on the military parade ground a large crowd assembled, which rendered landing a difficult problem. In avoiding a lady and a baby, Lieut. Fequent brought his machine down suddenly and damaged it slightly.

"Pierre Marie," flying a R.E.P. monoplane on July 13, accomplished the longest flight so far made on this make of machine. Rising from the Buc aerodrome to a height of 600 metres, he flew over a wide expanse of country, comprising Toussin-le-Noble, Guyancourt, Voisin-le-Bretonneux, and return to Buc, remaining in the air 45 minutes 25 seconds.

On July 15, at Mourmelon, Forest made a flight of 45 minutes on his Voisin machine, and De Ridder was up for an hour on his new racing biplane, while later he carried several passengers. On July 17, Henri Bregi took a trip on a Voisin over the country for an hour at a height of 200 metres, and Bielovucie, on a racing Voisin, was in the air for half an hour. Forest's flights were made in a strong wind.

Thirty-five entries have been made for the aerial race, from August 6 to 21, for the prize offered by "Le Matin," and the result of the ballot for order of starting is Nieuport first, Breguet second, Martinet third, de Baeder fourth, and Latham fifth. Other well-known flyers and their places are Aubrun (9), Labouchère (11), Efimoff (15), Morane (19), Leblanc (22), Wagner (24), Sommer (25), Audemars (34), while the last to go will be Simon on a Blériot.

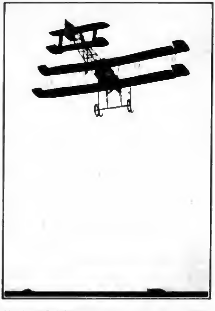
On July 4, Kolchlin flew for three-quarters of an hour on his monoplane at Juvisy.

Germany

Zeppelin VI. will commence its passenger tours from Baden-Baden on August 20 or thereabout in the place of the ill-fated VII. A provisional cabin has been built into the gangway, with sitting accommodation for ten passengers.

Herr August Euler is designing a military aeroplane for the German War Office, which will not only carry the passenger in comfort well behind the pilot, but have a writing board fixed to allow drawing and communications to be made in flight, as well as photographs to be taken; there will also be an opportunity to throw out bombs.

The carbonium factory which supplies the Zeppelin firm at Friedrichshafen with its hydrogen gas has been destroyed by an explosion, caused, as it is at present believed, by back-fire in one of the three cylinders in which acetylen is divided into its liquid and solid compound parts. Nine workers were injured, and one has succumbed since then.



THE LATEST GOUPY BIPLANE PILOTED BY LADOUGNE AT THE RHEIMS MEET

Germany's list of pilots is steadily growing, as both Lieut. Thiedemann (Sommer) and Herr Brunhuber (Albatros) have passed their examinations at Doeberitz, near Berlin.

Mr. Hayden Sands, the American aviator who introduced flying to Strassburg, and whose Antoinette was used by Wiencziers on his daring flight around the Cathedral, will not give any more performances at present.

Theelen, who has been so successful with the German-Wright machine, had a nasty accident at Berlin on July 19, very similar to the one which cost Rolls his life. Fortunately, in this case the pilot escaped with a few cuts and scalp wounds, but the biplane was utterly destroyed.

Essen has decided to hold a flying meet during October. Large prizes have been offered, and the meet promises to be a success.

Although it will probably never be known exactly what caused the disaster to the Erbsloh dirigible on July 13, there is no doubt that the gas envelope burst; and experts believe that it was due to the fabric of the envelope, which was much worn, being overstrained by the expansion of the gas when the airship ascended to a great height. When the craft rose from Leichlingen, the only unfavorable condition was a thick mist which hovered over the ground. After cruising for some time at a height of 200 metres, the vessel rose to 750 metres and then descended to 280 metres, when the accident occurred. The five occupants of the car, Herr Erbsloh, the designer; a friend named Toelle; two engineers, Kranz and Hopp, and the mechanician Spicks, were instantly killed. Herr Erbsloh was an experienced aeronaut, and in 1907 won the Gordon-Bennett balloon race in America. He had formed the Rhenish-Westphalian Motor Airship Company to build the airship, with which he had been experimenting since last Autumn. The airship was of the non-rigid type, 176 feet long and 31 feet in diameter, and was fitted with a Benz motor of 125 h.p.

On July 13, "Parseval VI." sailed from Bitterfield to Dresden, where a large crowd, including the King of Saxony and Prince George, assembled to greet the airship. It was intended that the airship should go on to Munich or Gotha, but on the following day it returned to Bitterfield, making a descent at Wurzen for a slight repair. On the same day "Parseval VII." made a successful trip from Breslau to Alshude.

The Baden-Baden meeting was opened on July 22. The weather turned gusty as the day wore on, and it was long past the time set before any ascents could be made. Unfortunately, Amerigo's machine had been damaged in the rain—another danger for aviators this—and he was unable to take part in the flying, which was restricted to Jeannin and Behrend. Jeannin's total time aloft was 21 minutes 17 seconds; Behrend's only 12 minutes and 9 seconds, and the greatest altitude achieved was Jeannin's—74 metres.

Italy

The Italian government has appropriated $5,000,000 for aviation purposes. Great excitement was witnessed in the Italian Chamber of Deputies on June 2, when the sum of $5,000,000 was voted for aviation. The money will be expended in the construction and maintenance of aeroplanes and dirigible balloons.

Lieut. Savoia, who has been practising at Mourmelon (France) with a Henry Farman biplane, took one back to Italy with him. On June 30 he made a cross-country flight of 40 miles, from Centocelle and back; while on the following day he flew from Centocelle to Bracciana, a distance of 22 miles in 31 minutes. During the trip he reached a height of 3,000 feet.

Duray, who was at the hospital at Verona, has finally recovered from the dangerous accident he experienced at the recent meeting held there when he was hit by his propeller in motion.

Luxemburg

Hilbert has been making some fine flights on the Voisin biplane of M Bettendorf at Mondorf.

Roumania

Guillemin was flying above the lake at Chitila when his motor stopped; the biplane was smashed in the ensuing contact with the water, and Guillemin broke his leg.

Russia

The Russian engineer Heine has been making some remarkably successful experiments with a Blériot over the plains at Knurenevka; his speed was about 45 miles an hour.

Outotchkine recently succeeded in flying across the Gulf of Odessa—fourteen miles—on a Gnome-Farman.

Spain

Before coming north to take part in the Rheims meeting, Mamet made some very fine flights on his Blériot at Palma; these, the first ever seen in the Balearic Islands, excited an immense amount of interest among the natives for many miles around.

Turkey

What interested the Turkish Mission most on its recent visit to France was the flying witnessed at Issy and at Rheims. The Turkish government is contemplating investing in a fleet of French aeroplanes.

Late News by Cable

For the first time in the history of mankind, the English Channel has been crossed by two men in an aeroplane.

An August 17th, John Moissant and his mechanic, made the Channel crossing in a Blériot monoplane, completing the second stage of their great Paris to London flight.

By this flight Moissant has placed himself among the world's greatest aviators.

The flight was made for a prize of $20,000, offered by the *London Daily Mail*. Moissant started from Paris on August 16th, and flew to Amiens, where he stopped over night, leaving the next morning at 5.15 for Calais, arriving there at 7.10.

At 10.45 he started out across the Channel still accompanied by his mechanic, steering all the way by compass and fighting against a stiff wind that would have halted far more experienced aviators.

He arrived at Deal, England, at 11.30 A. M. Setting out for London the next day, he was forced to descend about thirty miles from London.

On August 17th, Alfred Le Blanc won the Matin's prize of $20,000 by finishing first in the last leg of the great aerial race of 480 miles.

The race began on August 7th, and was the first aeroplane contest in the world, wherein the schedule was fixed weeks ahead, and the competitors had to take the chance of wind and weather.

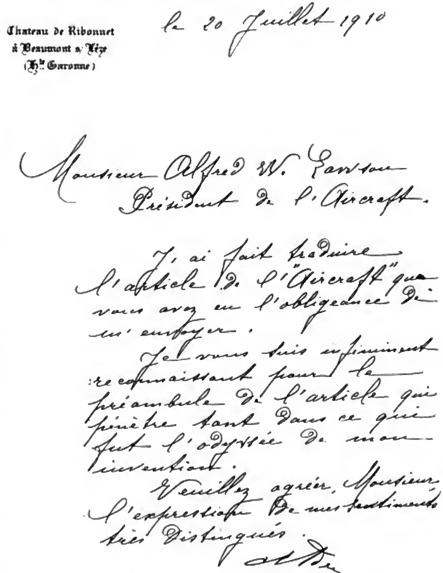
The flight was a circular one of 480 miles, which had to be covered in six stages.

The trip started and ended at Paris, and the successful competitor covered the distance in 11 hours 56 minutes.

There were thirty-five entrants, but only nine started. Of these all but Le Blanc and Aubrun dropped out at various points. Aubrun finished a close second.

J. Armstrong Drexel, an American residing in England, is the present holder of the world's altitude record.

At the recent Lanark meet in Scotland, he rose to a height of 6,750 feet in his Blériot monoplane.



Chateau de Ribonnet
à Beaumont s/ Lèze
(Hte Garonne)

le 20 Juillet 1910

Monsieur Alfred W. Lawson
Président de l'Aircraft.

J'ai fait traduire l'article de l'"Aircraft" que vous avez eu l'obligeance de m'envoyer.

Je vous suis infiniment reconnaissant pour le préambule de l'article qui pénètre tant dans ce que fut l'odyssée de mon invention.

Veuillez agréer, Monsieur, l'expression de mes sentiments très Distingués.

Ader

CONGRATULATORY LETTER TO AIRCRAFT FROM CLEMENT ADER, THE MAN "WHO BUILT THE FIRST AEROPLANE THAT EVER GOT OFF THE GROUND.

STANLEY Y. BEACH'S MONOPLANE AFTER TAKING A HEADER OVER THE CLIFF AT BRIDGEPORT, CONN.

CLUB NEWS

By Ada Gibson

National Council of Aero Club of America

A MEETING of the Executive Committee of the National Council of the Aero Club of America was held on August 1, at which it was decided by a vote of 5 to 2 that no aviation meet in this country should be sanctioned unless the entry of every aviator who desired and who was in good standing in the parent body was accepted. At the same time the following resolutions were adopted:

"*Resolved*, That no sanction for a meet, congress, contest or exhibition shall be granted to any club by the National Council except upon the express condition that any such event shall be open to entrance by any qualified and licensed aviator, and no ground or reason other than that formulated by the National Council or the Contest Committee shall be deemed sufficient reason for refusing the entry of such aviator, and violation of this rule shall annul such sanction.

"Whereas, the Executive Committee has considered the question involved in the Curtiss and Hamilton controversy, so far as the same affects the National Council and nothing therein has been charged or developed which in any way reflects on the personal or official conduct of Jerome S. Fanciulli, the Secretary of the National Council.

"*Resolved*, That this committee hereby takes the occasion to indorse Mr. Fanciulli's conduct in all matters pertaining to the office of Secretary."

It was for the Harvard Meet that the entry of Charles K. Hamilton was refused after it had been solicited repeatedly, and received finally, because Jerome S. Fanciulli, Glenn H. Curtiss's business manager, so it was claimed, stated that if Hamilton's personal entry was accepted, Curtiss, J. C. Mars, Charles F. Willard, Thomas S. Baldwin and other Curtiss aviators would not compete

It was said that Fanciulli told the promoters of the Cambridge tournament that Hamilton was still under contract to Curtiss for two years more. After Curtiss had been notified by Hamilton on July 8 at Atlantic City that he would no longer fly Curtiss biplanes, Curtiss sued Hamilton for $6,200, alleged to be due for unpaid royalties. Hamilton filed a counter suit against Curtiss, claiming abrogation of the contract by written release, damages of $14,000 for nonfulfillment of contract, delay in sending aeroplane repairs, etc., and ever since July 8 has denied that he was under contract with Curtiss.

The Executive Committee, in a session from which Fanciulli was barred, then passed the resolution concerning sanctions and further ordered the application of the Harvard Aeronautical Society for a sanction returned, disapproved.

After sanctioning an aviation meet which is to be held in Pittsburg, the request of the Aero Club of Baltimore to have the elimination contest for the selection of the American team of three to defend the international speed prize against the challenging French and British teams, held in Baltimore, was read and filed

The applications of the Aero Clubs of Chicago, Philadelphia, Pasadena, Los Angeles, and Kansas City for sanctions for meets there were acted upon favorably, as well as one for an indoor exhibition at St Louis.

Many applications have been received for sanctions of meets and nearly a dozen clubs have applied for membership since the organization of the National Council.

The Council propose to keep on file all publications of interest to the members of the Council; and the secretaries of the various organizations are requested to send such publications as will be of interest in this connection.

California News

By W. C. Wheeler

The Pacific Aero Club held a most enthusiastic meeting on July 19 at the clubrooms in the Pacific Building, San Francisco. Judge Murphy of Oakland gave an interesting lecture on aeronautics in general. Mr. T. A. Mater of the Aldrich Aeroplane Co. also spoke. Great interest was shown by all present in the blue prints of W. A. Merrell's new dirigible which he is just about to build.

Certain it is that if the membership roll continues to increase as rapidly as heretofore, the board of directors will find it necessary to look for more roomy quarters.

To be convinced that aviation has taken a strong hold out in this section of the country one has but to look at the number of Aero Clubs that have been started around San Francisco Bay, which further convinces one that the art of flying has passed the experimental stage and is fast becoming one of the most popular sports.

There are now six clubs around the bay within a radius of 50 miles—The Pacific Aero Club, The San Francisco Aero Club, the Palo Alto Aero Club, Oakland Aero Club, The Greater Oakland Aero Club, The University of California Aero Club, all of which are in a flourishing condition.

There are about 20 heavier-than-air machines and 3 dirigibles in the course of construction at the present time.

The Farman type machine seems to be the most popular, the Blériot comes second, and the Curtiss third.

There are one or two Antoinette type of machines being built, but they do not seem very popular.

Cliff T. O'Brien is building another Farman machine, having wrecked his first one at the Emeryville Track on July 2, when it was overturned by a gust of wind, as he was passing the grand stand at a height of 25 feet. He expects to be ready to try out his second machine, which is to be installed with a Hall Scott 8-cylinder V-shaped, 50 H. P. motor, in a short time.

THE EATON TWINING MONOPLANE STANDING ON ITS NOSE AFTER MAKING A SUCCESSFUL FLIGHT AT THE LOS ANGELES MOTORDROME

F. P. Gillette is building a monoplane, which is a combination of the Blériot and Antoinette, the dimensions of which are as follows: 34 feet, from tip to tip; 6 1-2 feet cord, 4 1-2 feet camber, 20 feet fore and aft

There are 208 square feet in the main surfaces and 30 feet in the rear surfaces.

The planes will be covered with No. 6 Naiad cloth, and an engine of 30 horsepower, built by the Detroit Aeronautic Construction Co., will be installed. It will also be fitted with a Blériot type landing device The weight of the monoplane when finished will be 600 pounds.

One of the largest aeroplanes ever designed is being constructed by H. P. Neilson for Adrian Merle, of 2163 Alameda avenue, San Francisco. The machine is being built along the lines of the Curtiss, but will be about twice as large. It will be fitted with a 60-horsepower engine, and will have seats for two passengers, in addition to the operator.

Mr. Glenn H. Curtiss has been engaged by the California State Fair Association to give a series of exhibitions during State Fair Week.

George Loose has his monoplane nearly finished, and is about ready to install his motor; he is using a Hall-Scott 25-horsepower, 4-cylinder, vertical motor.

The Aero Club of Pennsylvania will hold an aeronautical exhibition in the First Regiment Armory, Philadelphia, October 22 to November 5, and has offered $1,000 in cash or plate to the winner of the Chicago-New York aeroplane race for the privilege of exhibiting the machine in which the race was won during the week of the exhibit.

CLUB NEWS

Harvard Aeronautical Society

By Edwin C. Brown, Secretary

The Harvard Aeronautical Society of Cambridge, Mass., through its president, Professor Abbot Lawrence Rotch, announces that it will hold an aviation meet on the society's new aviation field at Atlantic, on Dorchester Bay, from September 3 to 13, inclusive, with the exception of the two Sundays intervening. The programme of events and prizes already scheduled are as follows:

	First.	Second.	Third
Speed	$3,000	$2,000	$1,000
Altitude	3,000	2,000	1,000
Duration	2,000	1,000	
Distance	2,000	1,000	
Slowest Lap.	1,000	500	
Getaway	100	50	
Accuracy	500	250	

To the above must be added the two most important events of the meet, viz.: A flight against time from Soldier's Field to Boston Light and back, for which a prize of $10,000, offered by the *Boston Globe*, awaits the successful contestant, also a prize of $5,000 and the Harvard Cup for the aviator who makes the best record in dropping bombs on a battleship model, which will be set up on the field.

There will also be contests and prizes for novices.

A large number of entries from the ranks of the leading aviators of America, England and France have already been received by the society, thus assuring the success of the meet, which is not only the first to be held in New England, but by far the most important attempted in America up to the present time. Further entries will be received and fully detailed information furnished prospective entrants at the temporary headquarters of the society, 164 Washington street, Boston, Mass.

The Harvard Aviation Field, which consists of approximately 500 acres, has quite recently been leased by the society for a period of five years.

Grandstands to seat 20,000 people are being built, as also are other necessary structures for the accommodation of aviators and their machines. There will be a parking enclosure for 10,000 automobiles and standing room for 100,000 will be provided.

The Harvard Aeronautical Society, which is holding the meet under the sanction of the national body and with the co-operation of Harvard University and the City of Boston, includes in its membership and management many of the leading scientists of the university, and a large number of the most prominent of the Harvard alumni residing in Boston.

Los Angeles News

By H. La V. Twining

THE two photos accompanying are the "Aerage" of the Aero Club of California, and the Eaton-Twining machine, standing on its nose. This machine is a biplane of the Blériot type, except that it has sliding planes at the wing tip for securing lateral stability. This machine has been making small jumps for a couple of weeks. It is equipped with a Ford automobile engine of 22½ h.p., four-cylinder, water-cooled. The power plant weighs 200 pounds, and the whole machine 700 pounds, including the aviator. Warren S. Eaton was driving the machine when it went over on to its nose. It was running on the ground at the rate of 25 miles per hour when the front axle broke. As the tail was high in the air at the time, the tips of the skids stuck in the ground, and it ended up as shown. Mr. Eaton was thrown into the framework, but escaped unhurt.

On another occasion the machine turned turtle. This was before the main planes were put in place. In turning the machine skidded and rolled over on its back. Warren Eaton was driving, but he escaped unhurt.

J. J. Slavin tried out his biplane August 5 on the new course. The Los Angeles motordrome is one mile in circumference, thus making it 1,700 feet in diameter. On account of the space occupied by the track and the field fence, there is scarcely 1,000 feet for a straight run inside the track. A course outside has been graded and a track a mile in length has been provided. In the afternoon this faces the ocean breezes directly. Slavin made an attempt to win the Knabenshue cup on this course this afternoon. After running for some 500 feet he left the ground. This biplane is provided with automatic devices for securing automatic fore and aft stability and also for lateral stability. The main planes are so arranged that the reaction under the plane on one side automatically shifts the opposite plane.

The same thing is arranged for fore and aft stability. The automatic device and hand control are connected by a catch so that the hand control can be used when desired. When the machine rose the catch failed to work and it shot up into the air for 25 feet on a stiff grade. This brought the machine to a standstill and it dropped back to the ground. Owing to the fore and aft automatic devices, it righted as it came down. Otherwise it would have stood on its tail. Coming down on an even keel, the damage was less than it would otherwise have been. The running gear was smashed and some stanchions were broken.

Greer-Robbins' monoplane uses a vertical fin for securing lateral stability. The planes are close to the ground and the fin is situated in the middle of the machine. This machine has been off the ground for 95 feet.

George Duessler is driving a Farman type biplane of his own construction. This machine has been off the ground. It is equipped with a Mitchell automobile engine, 30 h.p., four-cylinder, water-cooled, weighing 300 pounds.

While trying out his machine recently the front control broke and the wind blew it back in his face, cutting his nose. He was otherwise unhurt.

There are thirteen machines housed in the aerage, and others are being built.

Pittsburg Aero Club Meet

The recent aviation meeting at Pittsburg, although marred by high winds and handicapped by the site fixed upon for the holding of the event, Brunots Island, nevertheless counted among its features some daring flights that naturally called for some very fine showings of skill on the part of the contestants. During the three-days' meet, Mr. Glenn Curtiss in particular gave some hair-raising exhibitions, while other aviators to give evening flights of note were: J. C. Mars in his "Skylark," and Captain Thomas Baldwin in his "Red Devil."

It is suggested that the Pittsburg Aero Club (under whose auspices the meeting was held) may with advantage choose another venue for its next meet, where the aviators will not be so subjected to the variations of air currents and treacherous winds which were encountered at Brunots Island, and which Curtiss declared would lead him to make radical changes in the construction of the steering gear and control of his aeroplane.

"AERAGE" OF THE AERO CLUB OF CALIFORNIA LOCATED AT THE LOS ANGELES MOTORDROME. MACHINES ASSEMBLED IN FRONT

RECENT PATENTED INVENTIONS.—Briefed by Gustave R. Thompson

U. S. Patent 962,172. June 21, 1910. E. W. Smith.

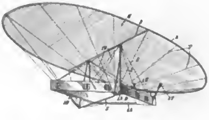
Toy aeroplane with elastic-band motor.

U. S. Patent 963,543. July 5, 1910. G. Geraldson.

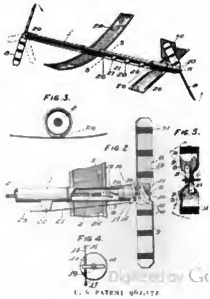
In this patent the car is pivotally suspended from the framework of the supporting plane. By moving the two relatively a greater or less angle of incidence is presented to the air and elevation or descent attained.

U. S. Patent 963,516. July 5, 1910. H. M. Chase and M. F. H. Gouverneur.

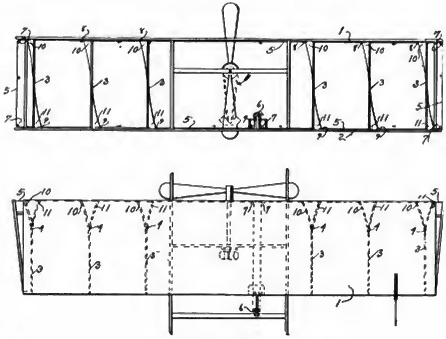
Lateral stability is maintained by vertical planes interposed between the supporting planes, which are given a helical or tortional twist to produce the desired stabilizing effect.



U. S. PATENT 963,543



U. S. PATENT 962,172.



U. S. PATENT 973,516.

SOME CONSTRUCTION DETAILS

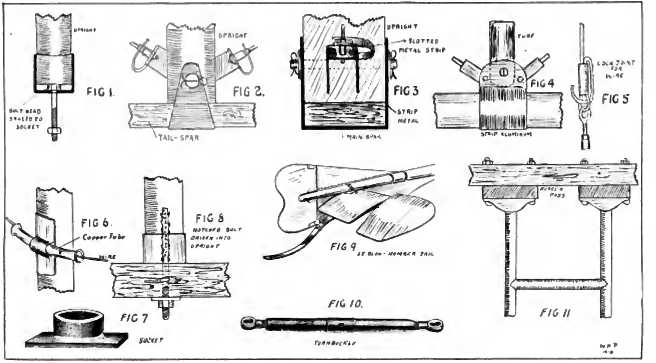


Fig. 1.—Illustrates the method of joining the uprights to the main-spars of the Frisbie biplane now at Mineola. It consists of a tubular socket with a bolt brased to it as shown.

Fig. 2.—Shows a joint used on the Wilcox biplane. The upright is joined to the spar by a metal strap, which is held in place by a steel tube.

Fig. 3.—Shows another method of joining the uprights to the main-spars as used on the Wilcox biplane. Note the method of locking the turnbuckles.

Fig. 4.—Illustrates a method of attaching rib spreaders—as used on the Edwards and Edick biplane at Mineola.

Fig. 5.—Shows a simple method of adding security to a wire joint. Doubling the wire over as shown makes a very strong joint.

Fig. 6.—Illustrates the method of conducting the control wires around corners as used on the Farman biplanes.

Fig. 7.—Shows an aluminum socket used on the Farman biplanes.

Fig. 8.—Illustrates a joint noticed on a machine being built at Mineola.

Fig. 9.—Shows the tail of the English Humber monoplane. The chassis consists of a tapered hollow spar in place of the usual trussed framework.

Fig. 10.—Shows a turnbuckle used on many of the foreign machines.

Fig. 11.—Illustrates a shock-absorbing device used on the Walden monoplane now at Mineola.

THE BUCHANAN METHOD OF PLANE MAKING

By E. L. Buchanan

DURING the course of a series of experiments with aeroplane models, which had for its object the devising of an automatic lateral stability device, some interesting facts were noted. It is the object of the experimenter to record them in this little paper in the hopes of their being of some slight assistance to those who are interested in the furtherance of the art of mechanical flight.

The first experiments of the series were made with a model of the Antoinette type, with a dihedral angle of 170 degrees. This model gave some very nice outdoor flights, but showed a strong inclination to duck unexpectedly. The Blériot type model was then tried, and acted so well that it was decided to use it with different attachments, designed to produce automatic lateral stability. Among these attachments may be mentioned the use of ailerons, swinging tips, sliding panels, changing of angle of incidence of the tips, etc. These devices were all arranged to be automatically operated by light springs, pressure on the surfaces or by the action of a pendulum. The results were varied, the very erratic action of the models being the most noticeable feature, when there was any wind blowing.

A device was then tried which belonged to the preventative class rather than the corrective, as were the others, and gave surprisingly good results.

A straight plane, A, Fig. 1 (with a parobolical curve of 1 in 18) was made up and connected by a small stick, B, with the following plane C, which was pivoted to permit an adjustment of its angle of incidence in relation to that of the main plane. A vertical fin, D, was then placed below in the center of the large plane, with the idea that a side gust which would tend to tip the plane over would strike the vertical fin, which, if properly proportioned, would counteract the dipping effect. After a few trials the proper size was found, which would permit of the plane being flown with, against, across and quartering into the wind without its tipping over. It could even be flown around the corner of a building. One of the peculiarities of this plane was its tendency to gain a higher altitude when struck by a sudden side gust; this feature, however, was not considered very objectional. The tendency to dip was overcome reversing the usual order of things by placing the main plane in the rear and the small plane in the front; it would then take up a gliding flight of its own accord, after the propellers had stopped running, and continue to glide until it landed.

The problem of automatic righting, in the event of being dropped from a height, was taken up and solved by giving the plane a slight dihedral angle (approximately 170 degrees), and making the vertical fin slightly larger to balance the greater rotating effect of the dihedral angle in the side wind. This plane could then be dropped in any position, and after a slight fall would begin to find its normal gliding position, always landing right side up.

There still remained the question of compensating for a difference in the velocity of the air meeting the plane, as in turning corners, and also encountered in entering or leaving swirls in straight flights. This problem was considered from many points, the experimenter favoring the idea of having valves in the planes at the tips, but hesitated to contemplate the mechanical difficulties which were bound to arise. However, a special plane was carved out of wood so as to eliminate the mechanical problem of putting in the valves. These were made something on the order of a trap door, being very carefully fitted and extending from the front to the back of the plane, and were normally held closed by the tension of a pair of springs, which would allow the valve to open at a pre-determined pressure. This scheme worked well where there was a plus velocity, but, of course, would not act with a minus velocity. That, however, is very readily rectified by supplementing with manual control, which is always desirable beyond well-defined limits.

The most astonishing results of the experiments with the wooden plane was the remarkable increase in efficiency it showed over the carefully constructed cloth-covered planes. This was undoubtedly due to its rigidity and all lack of warping or bellying under pressure. This led to the conclusion that a plane might profitably be covered with wood, provided it could be done with a minimum of weight and still retain the smooth rigid surface so much to be desired.

After many failures the Buchanan Method was evolved, which combines great strength and ability to retain a curve with very little weight.

A veneer of soft white wood is taken and steamed or sponged with hot water and laid out flat, the surface is then planed and made perfectly smooth on one side, after which strips of clear straight grain are selected for the making up of the sheets for laminating. A piece of canvas or other suitable material is then stretched tightly over a flat surface and given a coating of glue, the strips are placed diagonally across the long dimension and after being weighted are left to dry. After drying the sheets are then ready to be planed down to the final thickness, when they are ready for placing in the form. The form is of wood, and consists of two pieces, built up to the proposed curve of the plane to be made, and are so arranged as to be clamped together while the sheets are drying. Two sheets are then dampened with hot water to help them take the glue and to bend more easily. They are each given a thin even coating of glue and placed in the form, so that the grain of one sheet crosses the grain of the other, clamped together and left to dry, after which the plane is removed from the form and after taking off the canvas is smoothed up for finishing.

This consists of giving at least two coats of shellac to the surface and as much to the edges as they will take (usually about four coats). We are now ready for the final coat, which should be a good quality of spar or other weather-proof elastic varnish.

This method of plane covering, or more properly, plane making, gives an absolutely perfect curve under all conditions and adds quite materially to the strength of the structure as a whole, rendering it unnecessary to place the ribs so close together as is the present practice.

It is the writer's belief that this method of plane covering will, before long, entirely supplant cloth covered surfaces. It will not distort under pressure and will give a maximum of lift with a minimum of head resistance or drift and skin friction. It will also become more efficient as the speed is increased, provided that the curve has been properly designed as laid down by Prof. Montgomery in his very able treatise on that subject. This type of plane also lends itself very readily to any form of fastening to the main spars and can be made so thin (less than 1-16 inch if desired), that the additional weight is negligible and more than compensated for by the increase in efficiency over cloth-covered surfaces at equal speeds, with the added advantage of greatly increased speed, with the same power.

A few figures to show this would not be out of place: For example the Curtis bi-plane contains approximately 250 sq. ft. of lifting surface which is capable of carrying 4 pounds per sq. ft. when in flight with approximate angle of incidence of 4°. The cloth covering weighs about 3 ounces per sq. yd. or 1-3 ounce per sq. ft. We decide to replace this cloth covering with the Buchanan Method of plane covering and wish to make this very heavy for test purposes, say 1-8 inch thick; cubing the surface or

$$\frac{36{,}000'' \times 1\text{-}8''}{1728} = 2.6 \text{ cu. ft.}$$

in entire lifting surface. White wood varies from 25 to 40 pounds per cu. ft. according to grain and seasoning. Taking the mean of the two weights, or 32.5x2.6 = 84.5 + 15.5 for shellac, glue, varnish, etc. = 100 pounds minus 5.25 pounds for weight of cloth replaced = 94.75 pounds, added weight. The increase in efficiency over cloth plane we will conservatively estimate as being 25 per cent., this increases the carrying power of the surfaces, owing to installing of the Buchanan Method, to 1250 pounds for the entire plane minus 94.75 = 1155.25 or an increase in the total lifting power of the plane of 155 pounds. This corresponds to one additional passenger or extra fuel supply with the same effect and the same angle of incidence or the angle of incidence may be decreased 1° giving greatly increased speed and greater radius of action with the same quantity of fuel, etc.

To sum up, the ideal plane would seem to be one in which the elevator was in the front, together with all possible bracing and landing devices. In the case of the monoplane a slight dihedral angle. A vertical fin under the center of the plane to make possible easy flight across the wind, a vertical rudder in the rear with as little outrigging for it as possible. The aviator's seat, passenger accommodations, engine, tanks, etc., in front of the propellers, which should be behind the main planes to recover as much power as possible. Buchanan Method planes with valves set in the tips with manual and spring control to take care of turns and differential tip velocities. A coincidence of the center of pressure with the center of gravity, but if that is impossible, then have center of gravity slightly below the center of pressure, rather than above. For a landing device a combination of wheels and skids seems preferable, especially where rough country landings are encountered.

The writer claims no originality for any of the devices employed during these experiments, with the exception of the method of making the planes and the manner in which the valves are placed in the tips. For these he does claim originality, having no knowledge of any similar device. However, he has taken out no patents on either of these devices, nor does he intend doing so, his desire being solely to be of some small assistance in the furthering of an art which is destined to cause vast changes in the transportation methods and social economy of nations, in the not distant future.

If these devices are tried by the reader and are not found wanting it will be more than sufficient reward for his efforts.

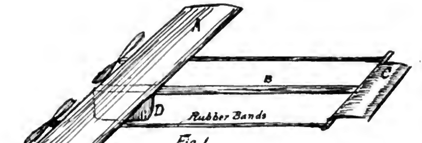


Fig. 1.

—THE—
BUCHANAN
METHOD OF PLANE MAKING

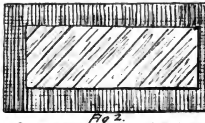


Fig 2.
Strips glued to Sailcloth to form solid sheet.

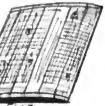


Fig 3
1/2 of Form

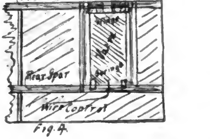


Fig. 4.

RECORDS AND STATISTICS

UNDER this heading we have recorded month by month the progress being made in the art of flying as indicated by what accurate figures were available.

As regards actual aviation records we have referred almost wholly to those of duration of flight, as being of more genuine interest, through being more easily and accurately ascertained and less dependent on outside conditions than others, such as height, speed, distance, starting, etc. The recent Rheims meeting, however, affords an opportunity of recording many remarkable and accurately determined performances in every line of competition which, excelling as they do all previous feats of flying, give a very clear insight of the present state of the art.

Below are compared the results of the four main competitions at Rheims in 1909 and 1910:

August 27-28, 1909—Duration, 3 hrs. 15'; Farman. Distance, 118.06 miles; Farman. Speed, 48.72 miles an hour; Bleriot. Height, 500 feet; Latham.

July 7 and 10, 1910—Duration, 5 hrs. 3' 5 1-5"; Olieslaegers. Distance, 244.04 miles; Morane. Speed, 66.18 miles an hour; Morane. Height, 4,540 feet; Latham.

The course in 1909 was a rectangle, 10 kilometres in circuit, while in 1910 it was a hexagon of but 5 kilometres circuit.

It will be noticed that the interval between the two Rheims meetings is but little over ten months; on July 10, a year ago, the four records were, respectively, 2 hrs. 20' 23 1-5"; 77 miles; 38 miles an hour; and 360 feet, so that the progress in the full year preceding the 1910 meeting is even more marked.

The duration and distance records prior to the Rheims week were, 4 hrs. 17' 53 2-5" and 144.29 miles (Henry Farman, November 3, 1909). It was not until the fifth day of the meeting that these long-standing figures were seriously threatened. On this day (Thursday, July 7th) Latham and Labouchère on their Antoinettes, and Olieslaegers on his Blériot started off early in the afternoon, bent on record breaking. The three monoplanes raced neck-and-neck for about three hours, Labouchère being the first to run out of gasolene and land after covering 118 miles; at three hours Latham led Olieslaegers by about two miles, but he had to land twelve minutes later, and the famous Belgian kept on.

At the great speed at which he was flying he reached the world's distance record after 3 hrs. 20' of flight (thus taking 58' less than Farman had to cover the 144-odd miles), and did not land until he had raised the record to 158.45 miles (in 3 hrs. 39' 29"), the flight counting for the Michelin Cup.

Two days later Labouchère not only smashed this new distance record by over fifty miles, but also surpassed the old duration record which had withstood the previous assault of the monoplanes, distance and time being 211.27 miles and 4 hrs. 37' 2-5"—the first time a man had ever flown 200 miles.

On this occasion Labouchère lunched in the air and claims never to have enjoyed a repast so much.

His triumph lasted but a day, for, on the last day of the meeting, Olieslaegers once more set his Gnôme awhirl and soared aloft, not to touch earth again for 5 hrs. 03' 05 1-5"! The distance was 244.04 miles, just 99¾ more than Farman's on November 3d, and 32¾ more than Labouchère on the previous day.

As Orville Wright had been the first to fly for one hour, Wilbur Wright the first to fly for two hours, Henry Farman the first to make a three-hour and four-hour flight, Jan Olieslaegers is the first to top the five-hour mark.

In speed, Morane, Olieslaegers, Leblanc, Latham and Labouchere fought it out all week, the final result being as follows:

5	kilometres	(Morane)	2' 48 2-5"
10	"	"	5' 42 2-5"
20	"	"	12' 45 3-5"
30	"	(Olieslaegers)	20' 41 1-5"
40	"	"	27' 26"
50	"	"	34' 06 3-5"
60	"	"	40' 56"
70	"	"	47' 46 1-5"
80	"	"	54' 44 3-5"
90	"	"	1 hr. 01' 23 1-5"
100	"	"	1 hr. 08' 01"
150	"	"	1 hr. 53' 28 3-5"
200	"	"	2 hrs. 31' 40"
250	"	"	3 hrs. 08' 44 3-5"
300	"	"	3 hrs. 47' 33 2-5"

All these world's records were made on Gnôme-driven Bleriots; the 5 and 10 kilometres on the new 14-cylinder 100-h.p. racer and the others on 50-h.p. racers.

The five kilometres figure out at 66.18 miles an hour, and when it is considered that starting and finishing line were one and the same (in other words that it is a performance over a 5 kilometre circuit), it is obvious that the straightaway speed of this monoplane is upward of seventy miles an hour.

The passenger-carrying records established at Rheims by 50 H. P. Blériots were as follows:

"Two-man" Flight—Duration (Aubrun), 2 hrs. 09' 07 4-5"; distance (Aubrun), 85.21 miles.

"Three-man" Flight—Duration (Mamet), 1 hr. 39'; distance (Mamet), 57.63 miles.

Aubrun's time is really only a record for monoplanes, both the Kinets having made longer flights with a passenger, as indicated in AIRCRAFT for June and July.

Aubrun's and Mamet's intermediary times were:

Aubrun and one passenger: 20 kilometres, 19' 30 1-5"; 30 kilometres, 29' 10"; 40 kilometres, 38' 51"; 50 kilometres, 48' 28"; 60 kilometres, 57' 58 2-5"; 70 kilometres, 1 hr. 07' 31 1-5"; 80 kilometres, 1 hr. 16' 59 2-5"; 90 kilometres, 1 hr. 26' 33"; 100 kilometres, 1 hr. 36' 06".

Mamet and two passengers: 10 kilometres, 10' 18 2-5"; 20 kilometres, 21' 14"; 30 kilometres, 31' 53 1-5"; 40 kilometres, 42' 32 2-5"; 50 kilometres, 52' 36 1-5"; 60 kilometres, 1 hr. 03' 20 3-5"; 70 kilometres, 1 hr. 14' 36 3-5"; 80 kilometres, 1 hr. 23' 33"; 90 kilometres, 1 hr. 36' 04".

The 10-kilometre record for a "two-man" flight was captured by Ladougne on his little Goupy biplane, the time being 8' 14 2-5".

In height Latham not only duplicated his victory of the previous year, but raised the European record to 4,540 feet.

This is, however, several hundred feet below the great heights reached by Brookins on this side of the Atlantic, the figures returned for his great effort at Atlantic City being actually 6,175 feet.

Besides Brookins, those who have been making American aerial history in the past few weeks are Curtiss, de Lesseps, and America's premier amateur, Clifford B. Harmon.

Harmon now holds the American records for duration of flight, for both lighter and heavier-than-air craft, and there is an interesting analogy between the two performances, for, whereas his balloon record with Augustus Post (48 hrs. 26') is the first time in American history that a balloon has stayed aloft for two days, his aeroplane record (2 hrs. 3') is the first time in America that an aeroplane has made a flight of two hours.

EUROPEAN LETTER FROM G. F. CAMPBELL WOOD

MY DEAR MR. LAWSON: I did not have to wait until I set foot on European soil to become acquainted with the aerial happenings of the day on this side of the Atlantic. Aeronautic news is now considered of sufficient moment to be dispatched by wireless, and when in mid-Atlantic I already knew of the first series of smashed records at Rheims and of Wachter's terrible accident on the first day of the meeting.

On arriving at Bournemouth, I found the place already in the grasp of aeroplane fever in an acute form; everything sold or hawked appeared to relate to flying, from postcards and toys to books and pamphlets calculated to make an expert on matters aviatistic of any and every tripper come down from town to see "this 'ere flyin'."

At the Burlington Hotel where we were and which was the headquarters of the Royal Aero Club, it was "elevators," "ailerons," "fuselages," "propellers," and "motors"—especially motors—from morning to night and with no other subject of conversation in the running at all.

The meeting opened on the 11th in most propitious weather and the first day's flying was well up to expectations, if not beyond. Christiaens and Grahame-White made two very fine flights for the distance prize—both well over two hours. Christiaens started on his racing Farman just three minutes after the meeting opened—eleven o'clock, while Grahame-White started only two hours before sunset. As the official closing hour for the flying was sunset, I could not imagine why he started when he did for this prize, especially when he had had all afternoon to avail himself of, but it turned out that permission had been granted him to go on flying, officially, until it was dark; the result was that he beat Christiaens's distance; it seemed terribly hard luck for the latter, not to say unfair.

It so happened that the hero of the day was Armstrong Drexel of Philadelphia; he made some magnificent flights for height on his Gnome-Blériot—by far the best ever seen in England, reaching 2,490 on his second attempt; Grahame-White and Rolls also flew high, and others, such as Dickson, Gibbs, Radley, Barnes, Boyle competed for the various prizes, Dickson and Gibbs on Farmans, Radley on a Blériot, Barnes on a Humber (English Blériot) and Boyle on an Avis.

The competition for the speed prize—five circuits—is very keen, but Christiaens makes the best time of the day in a wonderful flight close to the ground, coming at times within a foot of it after taking a sharp turn.

In the slowest circuit contest Rolls was easily first with 4' 11" for the 3,140 yards, in a very fine demonstration of slow flying.

It was on the second day that the tragedy occurred, which was to create such a sensation the world over and of which I was such a very close witness.

The wind was blowing toward the grandstands, and it was naturally surprising, under the circumstances, that this time should have been selected for the landing competition, which could have easily been put off. It was quite obvious that the best results would be secured by landing against the wind and equally obvious that the competitors would have to fly right over the grandstands and enclosure at a low altitude to do so.

At first the flyers did not attempt this. Grahame-White stopped within 45 feet of the bull's-eye, flying across the wind; Rolls, doing the same, landing 70 feet beyond the mark.

Dickson then landed against the wind but came down hard, breaking his chassis.

Rolls then came out again, having decided to swoop around over the grandstands and land dead against the wind.

The wind which was blowing gustily at about fifteen miles an hour seemed to bother Rolls quite a little as he circled the pylon, in accordance with the rules of the contest. By the time he was over the grandstands he was still quite high up—perhaps 100 feet, and he thus had to literally plunge down to land in the circle, between which and the grandstands I was standing with several others at the railing (at the nearest point in the enclosure to the landing circle and immediately opposite it).

This he proceeded to do and the great biplane came swooping down not thirty feet above our heads with that compound rattle and roar of engine chains and propellers peculiar to Wright machines, and which—seeing what immediately followed—I am hardly likely to forget for a time.

I got a very clear vision of Rolls drawing on his left lever (as he realized he couldn't make it safely, at that angle) at the precise instant he passed over and as we instinctively ducked and moved from the railing. As he did so a clear snap of breaking wood was audible above the noise of the engine and several small pieces of spruce fell among us from above; in an instant the biplane pointed downwards and with a sickening crash smashed itself to matchwood right in front of our eyes and not sixty feet away.

The propellers literally drove the biplane into the ground and Rolls was, of course, instantly killed.

The accident was, without doubt, caused by the rear horizontal rudder (which French Wrights now carry), breaking loose under the strain, as the plunging biplane was suddenly pointed upwards.

The consternation caused by the accident needs no description. Rolls was very popular and recognized the world over as a thorough and game sportsman.

Mr. Post had given me a letter of introduction to him, which I left for him at the hotel office—he was staying at the Burlington the night before his death, and as he started on his fatal flight I remarked that I was looking forward to meeting him that afternoon.

He was of a type of pioneer that one could not help admiring and when following big contests in France some years ago I saw him competing several times, notably at the Tuileries, in Paris, at the start of the first aeronautic Gordon Bennett Cup (balloons) in 1906, in which he was one of the seven who crossed to England that night, and in which he won the special duration prize, and also at the Circuit d'Auvergne in 1905, where at the wheel of his Rolls-Royce he also represented his country in a Gordon Bennett Cup—the last Gordon Bennett Cup of the motor world.

To return to "Bournemouth" the remaining days of the week saw the triumph of the great Blériot driver, Morane.

Piloting his 50-horsepower monoplane he won the speed, height and over-sea prizes with consummate ease, in a series of the most magnificent flights imaginable.

It is impossible to conceive anything more masterly than his flying, and as he soared up and up in the blue he held the whole crowd entranced with the apparent ease and security of his bird-like progress.

It was on Wednesday, the 13th, that Morane first flew at Bournemouth. It was a perfect day; a little haze and some fleecy clouds attenuating the glare, but leaving the sea clearly visible, glistening to the South, with the chalk cliffs of the Isle of Wight as a distant background, hazily visible twenty miles away.

The flying had not been of a very striking order; the bird-men seeming reluctant to once more undertake to violate Nature, after the horrible toll exacted the previous day, and had only treated the onlookers to a few short flights. After spending some hours in and out of the sheds, five o'clock found us (on the principle of "Do in Rome as the Romans do") before the inevitable tea tables on the lawn with many hundreds of others; it was then that we saw the Blériot in tow of its whirling Gnôme-Chauvière power-plant, soar upward at an angle indicating plenty of reserve power, and quickly gain unaccustomed heights above the aerodrome.

In great spirals Morane climbed in the sky, while we and those about us leaned backward and silently watched the rounded grey wings getting smaller and smaller above us, the purr of the engine occasionally wafted down to within our hearing by a turn in the wind. It became hard to tell from one moment to another if he was still rising, but when the monoplane hid for an instant the crescent of the new moon, this novel sort of eclipse immediately suggested a comparison—the Blériot was fully twice as wide as the lunar diameter, on the next turn it was barely as wide and we knew it must have risen far above its previous position, although the eyes constantly following it became too quickly accustomed to its slowly diminishing span, to have otherwise realized it.

On the next turn it was "half the size" of the moon and then if one took one's eyes off it for a moment it was hard to find it again—a greyish yellow speck in a greyish blue sky, with filmy, wraith-like clouds passing beneath it. It seemed incredible that a man was up there, lost in the clouds, and suddenly as eyes were strained to keep the tiny insect-like thing in sight, a murmur which was almost a cry arose from the gazing thousands; the monoplane had dipped suddenly downward and was sweeping toward the earth at a speed which increased its apparent size from second to second. It then turned at a wonderful angle and sped on downward in a sharp spiral—on one wing, so to speak—yet as graceful as a sweeping albatross and as steady and speedy as an express taking a banked curve. It was soon apparent that Morane had all but stopped his motor, the blades of the propeller revolving lazily and being plainly visible. He started the Gnome humming once more when close to the ground and after a series of beautiful turns at high speed, shut it off entirely, and floated to earth literally, as lightly as a feather—the exact moment of contact being almost impossible to determine.

Morane had risen well over 4,000 feet, and, had the weather been clear, could have easily discerned the coast of France seventy miles across the Channel.

After this Morane was of course easily the star of the meet, although Wagner on his racy-looking Hanriot and Audemars beneath the diminutive wings of his Clément-Bayard "Demoiselle" did much to entertain the crowd.

Among the biplanes, Captain Dickson, the hero of the Rouen meeting and Grahame-White, the popular idol in England, showed off to the best advantage, both being very much at home on their Farmans, and driving them with great skill.

Altogether, the flying was well up to expectations, but it must be said that the organization was a little disappointing. Perhaps it isn't quite fair to judge all meetings by the high standard set up at the big French tournaments, and it may seem churlish to make easy criticism where so much good will and desire to please are manifest, but the fact remains that less crudeness in the general arrangements and especially more competency in the actual management might well have been expected of the principal English meeting of the year; the license accorded to Grahame-White to fly after sunset (on the first day) seemed tactless, to say the least, especially if one considers that his direct antagonist in the contest was a foreigner, and White himself can hardly be blamed in the matter, neither can he be blamed in the two other cases where he appeared to be given an unfair advantage over other competitors, these were in the landing and starting prizes. In the former the aeroplane was to land in a circle one hundred yards in diameter, as near the centre as possible; the engine was to be stopped before crossing into the circle and the aeroplane was not to touch ground outside the circle. In Grahame-White's winning effort, he most obviously and certainly touched the ground with one wheel, just outside the circle, neither was he able to entirely choke off his ambitious Gnôme before having crossed the circumference; both infractions were without doubt unintentional, but why they should pass unnoticed officially on this account it is hard to understand; the officials were no doubt quite sincere in their belief that he had won the contest fairly, and that is perhaps the most astonishing part of it. In the same way in the starting prize, the competition was to be decided between twelve and one; the competitors of course faced the wind to start, and as the breeze was increasing it was obviously to their advantage to wait until the last minute that the contest was open; this Grahame-White wisely did, but when he got off—beating all his competitors—it was fully three minutes after one; he was nevertheless proclaimed the winner, whereupon the foreigners in the competition very naturally put in a protest; this, however, was not recognized as well founded until all the foreigners, Christiaens, Audemars, Wagner and Morane (the latter with the compliance of Blériot, who was present) had closed up their sheds and taken down their flags from over them. It was then admitted that Dickson was first, and that the mistake had arisen through the fact that the watch of the official in charge was four minutes slow!

In the over-sea flights to the Needles (Isle of Wight) and back, the Gnôme-driven Blériots of Morane and Drexel had matters all their own way; Drexel's machine was one of the first Blériots to be built to carry a Gnôme engine; Morane's tremendous advantage in speed was mainly owing to his having racing wings on his monoplane—much lesser span and much flatter; it also had many improvements of detail.

On the Saturday, Mr. Bishop turned up at the Burlington; he had been at Rheims and had been much impressed with the speed of the Blériots and wondered who could be found to oppose Leblanc in the Gordon Bennett; both he and Mr. Wallace, the president of the Royal Aero Club, seemed to think that the suggestion that Drexel might be persuaded to drive a 100-h.p. Blériot on the American team was a good one.

I was motoring over to the aerodrome that afternoon with Mr. C. G. Grey, whom you know as the editor of *The Aero* of London (and whose competency in matters aeronautic is, by the way, such as one does not meet in many a long day), but a soaking rain drove us to cover, and I thought I had seen my last flying at Bournemouth.

Later in the afternoon, after the sky had cleared and as I was walking in the town, an unmistakable sound coming from the clouds above made me look up, and there, perhaps 2,500 feet up, was a Blériot gliding through space. Every one seemed to be aware of it at the same moment, and all gazed in speechless wonder at the startling apparition—affording them a glimpse into the future.

And here let it be said that the general public in England seems at present to know considerably more about aviation than in America; for instance, on this occasion, "A monoplane!" was the exclamation heard on all sides, where in New York it would have been "An airship!" and those who had visited the aerodrome wondered if it were Morane or Drexel and discussed the differentiating points of the machines. It was, however, McArdle, and after a short trip over the town (but within safe gliding distance of the beach) he returned to his hangar at Christchurch.

The most successful of the all-English machines was certainly Cecil Grace's short biplane, which made several magnificent flights, notably one at a height of 1,000 feet.

There were a good many accidents during the week, outside of Rolls' fatal fall; Rawlinson and Christiaens had had smashes in their Farmans on the northeastern portion of the course, where the wind was tricky and the ground uneven; Rawlinson sustained a broken leg and Christiaens and his mechanic had a very narrow escape, the biplane being smashed into matchwood, when, after flying against the wind, it turned the acute angle of the course, which brought the wind behind it and thus temporarily deprived it of momentum sufficient to sustain it with its heavy load (this was in the weight-carrying prize).

On the last day Boyle's Avis monoplane fell over and he was badly hurt through being thrown on his head. A plucky and popular aviator, and one in whose company Mr. Grey and I had been only the evening before, at one of the many entertainments got up in Bournemouth during the week—in this instance a fancy-dress ball, where poor Boyle thoroughly entered into the spirit of the thing and amused all those about him.

There were no totalization prizes at Bournemouth; it was thought these would tempt the men to fly when the wind made it risky for them to do so; this is certainly their main drawback, but it is a question whether it isn't counterbalanced by their advantage, as affording a continuous "background" of flying, monotonous perhaps, but substantial.

At Rheims they had distance-totalization, but as I wrote in AIRCRAFT a month or two ago, I can't help thinking duration-totalization is a better plan.

You must have noticed that the Rheims course was hexagonal this year, which of course delighted me, fulfilling as it did my prophecy to Mr. Ludlow; the six-sided course has enormous advantages over the four-sided one, both for the spectators, for the aviators, for the speed and the accuracy of the distances recorded as flown.

To make a meeting a financial success in these days when the mere sight of a machine in flight is no longer sufficient to cause enthusiasm, calls for a mighty careful selection of events—to ensure constant interest and to eradicate the absolute monotony of the eternal circling of pylons.

It may be deemed advisable to hold certain events which belong more to a gymkhana than to pure sport, but in most cases they will increase the danger (as in the case of poor Rolls), and it can hardly be recommended to appeal to morbid curiosity to fill the grandstands. If other wholesome means can be devised to bring about the same result. I think there are two such means which have not as yet exhausted the interest of crowds. One is flying for height, and the other is cross-country flying.

For the former, the essential is the use of such instruments as will ensure the accurate calculation of the heights reached; also the more *monoplanes* entered the better; they are more graceful and bird-like than the biplanes and appeal far more to the crowd (as regards America, as they are almost unknown there, they should be a great drawing card, when they perform as they do over here). A monoplane's spiral glide from two or three thousand feet is worth going many miles to see.

Regarding cross-country flying, the great future of competitive events seems to be right there; the aeroplane which has gone out of sight, which is temporarily visible, which is awaited, interests more than that which relentlessly and obviously encircles the aerodrome hour after hour. In cases where a cross-country race is held in conjunction with a meeting, both start and finish should be at the track, and, if possible, the machines should start several at a time, or at thirty seconds interval. If the machines fly part of the way over water, so much the better, and the things to avoid as much as possible are of course towns and woods on the course selected. Here again the presence of monoplanes will enormously increase the interest. Heats reserved to monoplanes and others to biplanes, with the final a handicap between the winners, established on the times made in the heats, should make great sport (although, of course, when a machine is winning a heat easily it may delay crossing the finishing line to get a better handicap).

For the aerodrome itself, smooth and level ground seems the greatest requisite; over 70 per cent. of the accidents occur through landing on uneven ground; for the rest, a wide expanse with no obstacles to cause air disturbances, and easy curves (this is where the hexagon comes in) are, if not necessities, certainly desirabilities. And then, of course, the presence of real stars seems a *sine qua non* for success. A great many small meetings are held over here which attract no attention because none of the really great flyers take part in them; any meeting will fall flat if men like Curtiss and Brookins, and especially virtuosos such as Hamilton, Latham and Morane, are not there to arouse enthusiasm by their mastery of the air, and to fly when there is *any* possibility of flying.

It is to be hoped for the coming big meet in America that Blériot will take over a representative team besides Leblanc—who, although a great aviator, is by no means the wonderful natural bird-man that Morane is.

With Morane, Olieslaegers, Leblanc, Aubrun, Mamet, and perhaps de Lesseps, Barrier, Drexel, Cattaneo—success would be assured with the Blériot team alone; add to that Latham and Labouchère with Gordon Bennett Antoinettes and perhaps some of the new European monoplanes—Hanriot, Tellier, Nieuport, de Pischoff—seeking to invade the American market, and the single-deck type of machine would be more than well represented. In biplanes, America can handsomely hold her own, although a few Sommers and racing Voisins and one or two more H. Farmans would certainly be welcome and would make the meeting an absolute triumph.

There appears to be still some fear here, among the aviators I have spoken to, of patent complications if they come to America; the sooner this is made clear to all concerned, the better.

With remembrances to all at AIRCRAFT and at the Mineola "aviaries,"

I am, ever sincerely,

G. F. CAMPBELL WOOD.

Havre, July 29, 1910.

GENERAL NEWS

By Ada Gibson

International Aviation Meet

At a meeting of the Aero Corporation, Ltd., held on August 3, Mr. Gage E. Tarbell resigned the general managership of the International Aviation Meet.

At the same meeting it was decided to hold the International Aviation Meet at Belmont Park Track instead of at Garden City, L. I., as previously announced.

The following statement issued by Mr. Gillespie, chairman of the Subscribers' Committee, puts the present arrangements for holding the meet in a nutshell.

"The first international aviation contest to be held in America will be held at Belmont Park, L. I., from October 15 to October 23, 1910, inclusive. The meet will be given by the Aero Corporation, Limited, having offices at 12 East Forty-second street, New York, with the consent and under the supervision of the Aero Club of America, and in accordance with its rules and regulations.

The international race for the James Gordon Bennett Trophy, won by a member of the Aero Club of America, and to be contested for in this country this year, will be given in connection with a general tournament of aviation, running over a series of nine days, comprising contests in speed, altitude, endurance, and skill. It will include an elimination race for the selection of the American contestants to represent this country in the sixty-mile international race.

The funds required for giving the meet have already been entirely subscribed, and the list of subscribers is about to be closed. Such funds as are needed will be loaned by the Subscribers' Committee to the Aero Corporation, Limited, which will use them as required.

The presidency of the meet has been tendered to August Belmont, who has accepted the honor. The vice-presidents, most of whom are also subscribers, are Andrew Freedman, Alan R. Hawley, Charles Jerome Edwards, Bradish Johnson, A. W. Krech, J. C. McCoy, Allan A. Ryan, Samuel H. Valentine, J. J. Van Alen, J. L. Van Alen, John Alvin Young, John Jacob Astor, Cornelius Vanderbilt, Otto H. Kahn, J. C. Breckenridge, George W. Perkins, Russell A. Alger, Henry Clews, T. P. Shonts, V. Everit Macy, George F. Baker, Jr., De Lancey Nicoll, R. A. C. Smith, George C. Boldt, Cortlandt F. Bishop, James Gordon Bennett, Bernard N. Baruch, Redmond Cross, Richard Croker, Jr., Mortimer L. Schiff, J. A. Blair, Jr., William B. O. Field, and Lawrence L. Gillespie."

The committee in charge is actively engaged in plans for the proper transportation of the large volume of people who, it is anticipated, will wish to witness the events, and when they arrive at the grounds to see that they are properly provided with boxes, seats, or parking spaces.

Officials of the Long Island Railroad have assured the management that the crowds will be handled in a manner worthy of the event and the locality.

Further additions will be made to the list of officers, and announcement will later be made of the personnel of the Executive Committee, of the Finance Committee, and of the Committee on Aviation.

The stables of the Belmont track will be used as aeroplane sheds, and fences probably will be built around the northern and western ends of the park to prevent people from seeing the show for nothing, if the proposed meet is held there.

On the following day, August 4th, at a meeting held by the Board of Directors of the Aero Club of America, who represent the International Aeronautic Federation in the United States, it was announced that Mr. K. L. Bernard renewed his offer of last June to put up $40,000 in cash prizes to be competed for during the International Aviation Meet and to pay the Aero Club of America 10 per cent. of the receipts. Mr. Bernard's stipulation being that he be made general manager of the meet and that it be held on Long Island.

Following the meeting of the Board of Governors the Subscribers' Committee held a meeting, at which the heads of the different committees were elected as follows: Executive Committee, Andrew Freedman; Finance Committee, Lawrence L. Gillespie; Aviation, J. C. McCoy. These committees will immediately organize, and take hold of the organization work for the meeting at Belmont Park. Mr. Gillespie also named the following additional vice-presidents: Clifford B. Harmon, Philip T. Dodge, and Dave Hennen Morris.

Chicago-New York Race

A sanction has been granted by the Contest Committee of the National Council of the Aero Club of America to the New York *Times*, for the Chicago-New York race, which will start on October 8, for a prize of $25,000 offered by the New York *Times* and the Chicago *Evening Post*.

Among the aviators who have filed entries for the race are: Todd C. Schriver, American, Schriver biplane; Joe Seymour, American, Curtiss biplane; J. Olieslaegers, Belgian, Blériot monoplane; Charles K. Hamilton, American, Hamilton biplane, Glenn H. Curtiss (or representative), American, Curtiss biplane; J. A. D. McCurdy, Canadian, McCurdy biplane; Capt. Thomas A. Baldwin, American, Baldwin biplane; J. C. Mars, American, Curtiss biplane; Oscar P. Hellins, American, Hellins tandem biplane; Phillip Wilcox, American, Wilcox biplane; Charles F. Willard, American, Curtiss biplane; James Radley, English, Blériot monoplane.

A further interest to the Chicago-New York Race has been added by Clifford B. Harmon's offer of a prize of $1,000 to the contestant who flies the first 500 miles of the race in fifty consecutive hours.

Mineola

The usual daily flights, when the weather has permitted, have taken place at Mineola, L. I., during the month.

The steady influx of machines of all types continues, with the consequent erection of additional hangars and tents in which to keep them.

The Aeronautical Society of New York has enlarged its shed sufficiently to accommodate at least half a dozen extra machines.

Before coming to grief on his monoplane, which is of unique design, on August 3, Dr. Walden made several successful trials. The machine was little damaged, but Dr. Walden was unfortunate in breaking his collar bone.

Another interesting monoplane on the Aeronautical Society's ground is that of Mr. Elmer Burlingame. A drawing of this diminutive machine, which is fitted with a 30-horsepower Harriman motor, and which its owner calls the "Imp," appears on another page of this issue.

Mr. Wilcox has removed his Farman type biplane to White Plains, N. Y., for the purpose of demonstrating the principles and uses of the aeroplane to the New York Signal Corps, now carrying out field maneuvres on the Plains.

During the last few days four Curtiss type machines, built by the Witteman brothers, have arrived on the field for different members of either the Aero Club of America or the Aeronautical Society of New York.

A good deal of excitement has been caused by the painting on the aviation ground of a huge battleship over which the aviators fly and compete with each other in dropping bombs from their aeroplanes from different heights on to the dummy ship in an endeavor to ascertain the possibilities of the aeroplane in war time.

Mr. George Russell is fast becoming a prominent flyer at Mineola; he is making flights nearly every day with his Curtiss biplane, which is installed with a Harriman engine of 30 H. P. The Vaanden biplane, which is also fitted with a Harriman motor, is awaiting some part of its mechanism.

St. Louis Aero Show

That exhibits of complete aeroplanes and motors built expressly for aerial use will be the feature of the St. Louis National Aero Show in the Coliseum, October 8 to 13, is now assured by contracts for floor space, which have been made by several well-known concerns, among them the agents for the French Gnôme motor.

Complete aeroplanes and a new aero motor will be shown by the Aerial Navigation Co. of Girard, Kan. This concern has already completed three machines of the same type, which are reported to have been sold, and has now constructed three more.

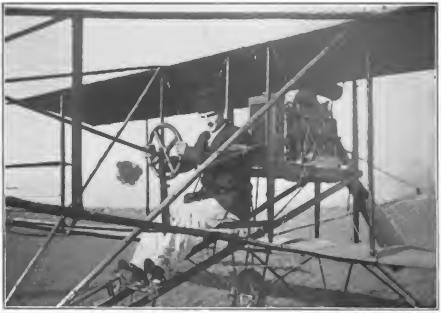
The Aeromotion Company of America (St. Louis) has taken space in which to exhibit the Gnôme motor, and has reserved additional room for exhibiting two types of foreign-made aeroplanes.

Another type of rotary motor which works upon practically the same principle as the French-made Gnôme will be exhibited by the Holmes Rotary Motor Company of Denver, Colo. The Western Oil Pump and Tank Company (St. Louis) has taken space and will exhibit its regular line of tanks and self-measuring pumps, but in addition to this it is rumored that this company will show something novel in the way of an aerial accessory which will be of considerable importance to aviators.

The Aeronautic Supply Company will be another St. Louis exhibitor, showing practically everything for the construction of complete planes, as well as the finished machines.

G. L. Holton, manager of the show, has received such a vast number of inquiries from inventors of all sorts of aerial apparatus throughout the country who wish to reserve a small space, in which to explain to the visitors the merits of their various inventions. The demand for space from these inventors has been so great that spaces are now being arranged for small exhibitors and can be obtained for a nominal sum.

S. L. Saunders, assistant mechanician to James V. Martin, has completed and successfully flown a model aeroplane of new design. In this model the steering gear and aviator's seat are placed beneath the lower plane of the main planes. The model is four feet wide and three feet six inches long and is claimed to fly more rapidly than any model aeroplane yet designed.



GEORGE RUSSEL IN HIS CURTISS BIPLANE WHICH IS INSTALLED WITH A HARRIMAN MOTOR

The inventor believes that a full-sized machine built on the lines of the model and fitted with an engine of 250 horsepower will easily carry three persons.

Mr. H. J. Willard of Providence, R. I., is building a monoplane of unique design. Mr. Willard, who until a few months ago was connected with the American Locomotive Co., is also said to be perfecting an engine which, it is claimed, will weigh 150 pounds and develop 100 horsepower. A special feature of the monoplane is a patent automatic landing device, while the helicopter method of rising from the ground is adopted.

The most successful flights which have taken place in Alameda County, Cal., have been made by Blaine Selvage in a monoplane, which he built himself. Three times on the same day he flew several miles and returned to the starting place without the slightest hitch.

Selvage's monoplane, which is a combination of a Blériot and Antoinette, is equipped with an engine designed by himself, which develops 30 horsepower and weighs 103 pounds. One of the means by which he secures lightness in his engines is by using an open crank case. The whole of the machine has been carefully thought out and constructed with exceptional neatness. Not an ounce of superfluous material has been used anywhere, but at the same time strength has not been sacrificed for lightness. Selvage's ambition is to be the first aviator to fly across San Francisco Bay.

Among the airship inventors of Lynn, Mass., is Ernest Begin, who has already won a reputation as an inventor of domestic labor-saving devices. He is working on two machines, a monoplane and another machine of the ornithopter type, with wings 24 feet in length and 12 feet wide.

Congressman Butler Ames of Massachusetts recently demonstrated his machine for navigating the air at the Naval Academy, Annapolis, before the board of officers, composed of Lieutenant-Commander Frank Lyon and Lieutenants Charles P. Snyder and Charlton R. Kear.

Six members of the Thousand Islands Yacht Club, which has a home on the St. Lawrence River, have constructed an aeroplane of the conventional biplane type. An attempt was made to fly the machine at Morristown, N. Y., which ended in failure through the breaking of a propeller.

The six men interested in the new flier are Dr. Miles J. Gibbons of Brooklyn, general attorney for the Brooklyn Rapid Transit Railway, its designer; Alfred G. Miles, chairman of the regatta committee of the Thousand Islands Yacht Club; Frederick K. Burnham, C. L. Hayden of Columbus, Ohio; Price McKenney of Morrisburg, Ontario, and Lee Rumsey of St. Louis.

The biplane measures 8 feet from tip to tip, and is one foot less in fore and aft measurement. The planes are five feet wide and six feet apart. Ailerons 8 feet long and 3 1-2 feet wide are employed. The front control is of single plane construction, the rear control likewise consisting of one horizontal plane and, of course, a vertical rudder. The machine is driven by a four-cylinder, 40-horsepower motor of the two-cycle type.

Seven aeroplanes, among which was the Farman biplane with which the French aviator won a world's record and which subsequently became the property of J. W. Curron of Hawthorne, Ill., were all recently wrecked during a wind storm in East St. Louis. The other machines which were destroyed belonged to local amateurs.

It is reported that the Wright brothers have signed a contract with the Chamber of Commerce of Dayton, Ohio, to make a series of flights during the Fall Festival and Industrial Exposition, which is to take place September 19 to 24. There will be prizes for altitude, speed, endurance, long glide and accuracy in stopping at a predetermined point.

A training school for aviators has been opened at Hawthorne Aerodrome, Chicago, Ill., under the able direction of Mr. M. L. Kasmar, author of "First Lessons in Aeronautics," where both piloting and constructional work will be taught. The services of Mr. J. W. Curzon have been secured as instructor and demonstrator.

We are informed that Cleveland now has two aeroplanes, one belonging to Mr. Winton of the Winton Automobile Co., and a Demoiselle, which is owned by the Country Club. Neither machines have as yet made a flight.

Frank Goodale recently made a flight in his baby dirigible from Palisade Park to the *Times* Building and back in 40 minutes, beating his own time of last year over the same ground by nine minutes.

A very fine aeroplane cloth, being manufactured by The H. M. H. Mills, is of silk dressed with a secret preparation, which, it is claimed, makes it sun, wind, rain and air proof. It is exceptionally light, weighing only six ounces to the square yard, while the tensile strength is 50 pounds to the square inch.

A new type of monoplane is being manufactured by J. W. Corzon, of 1806 North Thirty-ninth street, St. Louis, Ill., specification of which is as follows: Main planes, 35 x 7, chassis similar to Farman, but with bottom plane entirely removed with exception of middle section, which is made much narrower, and is placed lower down so that the driver sits immediately above the wheels with engine at his back and propeller, which is chain-driven, far above the engine, thus placing man and motor far below the main lifting surface, which is 12 1-2 feet high in order to maintain stability in all kinds of weather. Single plane stabilizer behind as well as horizontal rudder in front, 15 and 18 square feet, respectively. It is fitted with an Eldridge Power Plant and a Curron patent stability device.

At the Asbury Park, N. J., Aviation Meet, to be held under the auspices of the Asbury Park Aero and Motor Club, prizes amounting to $20,000 will be competed for by both professional and amateur aviators.

The meet will take place at Interlaken, an Asbury Park suburb, and it is scheduled for August 10 to 20.

New Companies

The Non-Capsizable Aeroplane Co. of Patterson, N. J., with Peter L. Alberse as agent, has an authorized capital stock of $50,000.

The objects of the company are to build and sell air crafts. The incorporators are William P. Gary, Joseph Van Walraven and Peter L. Alberse, all Paterson men.

The Latendorf Aerial Navigation Company filed articles of incorporation with Clerk John F. Crosby of Hudson County to manufacture and deal in airships. The office will be at 34 East Twenty-eighth street, Bayonne. The authorized capital is $50,000, divided into 1,000 shares of $50 each. The incorporators are Lowell B. M. Hoog of Orange, G. Edward Menzel of Maplewood, and Howard W. Forsyth of Mount Vernon, N. Y.

A company has been organized and incorporated under the laws of Arizona, with $5,000,000 capital, to be known as the Universal Aerial Navigation Co., and is formed for the purpose of manufacturing, patenting, improving, purchasing and operating of airships of every description. The company has in course of construction a craft which is the invention of I. W. Oman and which he calls a gyroplane. Embodied in this machine are the principles of both the gyroscope and helicopter.

The officers and directors of the new company, who are St. Louis men, are as follows: F. A. Siefert, president; William Ramsey, first vice-president; C. L. Bernays, second vice-president; W. H. Walters, third vice-president; Meyer Isaacs, secretary and treasurer; J. W. Oman, general manager. The board of directors comprises the officers and the following additional members: H. C. Andree, William A. Barris, John Elisperman, D. A. Fletcher, R. Muehlberg, T. P. Plumridge, J. Fred Schaberg, Jr., and Louis Boight, Jr. Claud D. Hall is attorney for the corporation.

Another New Motor

THE Detroit Aeronautic Construction Company of Detroit, Mich., has constructed a new lightweight aeroplane motor. Its 30-40 horsepower motor weighs well inside of one hundred and seventy-five pounds, including a double ignition system, carbureter and propeller.

The company realized that in order to secure efficient service, all friction must be reduced to the very minimum, is using in the construction of its motors ball bearings wherever the same are at all practicable or applicable.

With the exception of the cylinders, pistons and crank shafts, the entire motor is built of aluminum, including the Schebler carbureter, which is being made especially for this motor, thus reducing the motor to the very minimum of weight, without sacrificing strength in any way. The 30-40 h.p. motor occupies but about eighteen by nineteen inches of space over all.

The cylinders on all motors are cast en-block.

The crank shafts are cut out of solid block of chrome nickel steel, and are carried on two large Hess-Bright ball bearings.

All rotary parts are thoroughly balanced and in every way made as light as possible, without, however, sacrificing strength for lightness.

The intake, as well as the exhaust valves, are made especially large, thus insuring perfect intake of fuel, as well as absolute scavenging of cylinders.

In the construction of the intake valves and manifold, the company has gotten away from the adopted form, and has adopted a system of its own, which is absolutely unique insofar as compactness and simplicity are concerned.

The exhaust is effected by a peculiar cam operation, giving an easy rotary movement, combined with quick action, and is absolutely fool proof.

The company has also gotten away from the ordinary, in its oiling system, which consists of a very small rotary gear pump, built in the crank case, so as to be easily accessible in case a repair should be necessary, which forces the oil to all cylinder and connecting rod bearings. The oil being pumped from a sub-base to the cylinders and to the crank case, makes a splash sytem, a level overflow pipe to the sub-base, taking care of all excess oil.

Years of experience in building motors for racing boats has taught the company that in order to secure absolute ignition its motor must be equipped with a double ignition system. This system consists of a Bosch magneto and of a primary and secondary distributer with a single coil, making a perfect ignition system.

The carbureter, as already stated, is the famous Schebler carbureter, especially made of aluminum for this company.

That the motors built by this company are a success is proven by the many orders which it has received from persons who have spent much time and money in experimenting with other motors.

The company is now making arrangements for the building of a larger factory, in order to enable it to take care of its rapidly increasing business. All motors are furnished with either aluminum fly-wheels or laminated wood propellers.

FLYING MACHINE MODELS

By W. H. PHIPPS

FLYING MACHINE MODELS

KITE contests and model competitions for the cup donated by Mr. Edward Durant are being held every Saturday at Mineola. The winners so far are Frank Krug, John Kinsella and Carl Mitehouse.

Exhibitions of models and kites were held at the Oriental and Manhattan Hotels, Manhattan, on July 31.

The exhibitors were P. W. Pierce, with a beautifully constructed Antoinette model. Frank Schober showed his record-breaking Langley model. The other exhibitors were boys from Public School, No. 77.

MODEL GLIDERS

Fig. 1 shows scale-paper gliders of the Blériot, Antoinette and Demoiselle types. The models are to be cut from stiff writing paper to the dimensions given, and a pin or other small weight attached to the head as shown. If the gliders dive after leaving the hand, it is a sign that the pin is either too far forward, or that the weight is too heavy. To rectify this push the pin back or lighten the nose of the model.

MODEL CONSTRUCTION DETAILS

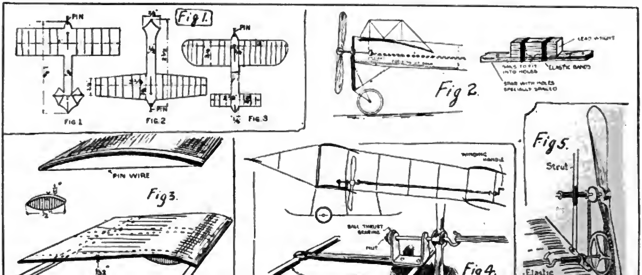
Fig. 2 shows a method of balancing a Blériot model. A small lead weight is strapped with elastic bands to a small spar as shown. The correct balance of the model is obtained by shifting the weight backwards and forwards until the centre of gravity is found. This method of balancing is only advisable in models using tractive propellers, as the front of such must necessarily be weighted to bring the weight of the elastic motor off the tail.

Fig. 3 illustrates two methods for keeping the curve in the ribs.

Fig. 4 shows an excellent method of attaching a rubber-band motor to a Farman type model.

Fig. 5 shows a successful belt-driven rubber motor. The gear is for use on a biplane, and it may be seen from the sketch how it is constructed. The bearing for the propeller shaft is fastened to one of the canes that support the upper plane. To keep the shaft from slipping about, two rings of metal are placed one at each end of the bearing, as illustrated, and then soldered down to the shaft. The bearing for the lower shaft is screwed down to one of the cross members of the plane. The power is transmitted from the large cog-wheel to the small one by means of a strong but thin leather belt, with holes punched in to suit the cogs, which must be kept very well oiled to keep it flexible.

We have the London magazines, *The Aero* and *Flight* to thank for several of the originals shown here.



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The inventor will give any company or club plans for development and then have shares of its earnings. Write for full particulars to Jno. McDonald. Jr., Point Prim, P. E. I., Canada.

WANTED—Capital to build flying machine; exchange for part interest in invention, or will sell share; patent applied for; also most up-to-date folding umbrella, patent applied for. Address Flying Machine, Box 174, Washington, Pa.

HAVE NEW MONOPLANE, no freak but a sane Langley-type machine, with absolutely new steering and balancing mechanism. Want $1,500 for construction of a machine. Offer interest in patents. John G. Hanna, Box 55, Union Sta., Austin, Tex.

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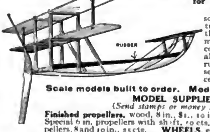

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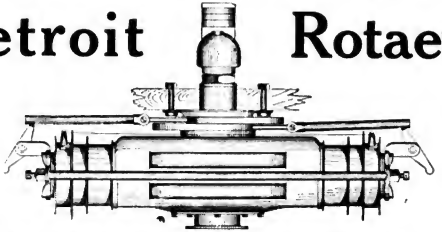

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The 6 ft. propeller gives 200 lbs. thrust at 1200 R. P. M.	
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1/32 in.,	breaking strength,	200.	Price,	3c	per ft.
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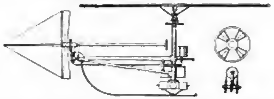
Thou hast my choicest model ta'en—
How shall I see to make a Fool again?"



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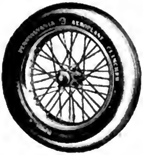

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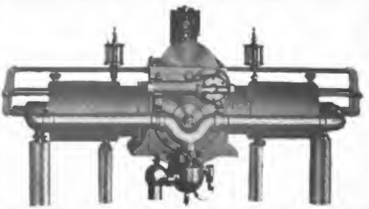

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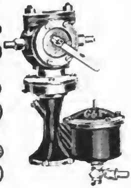

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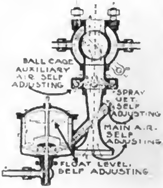
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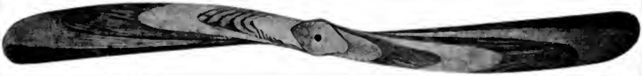

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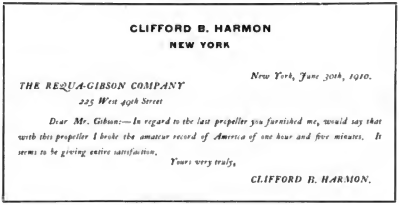
Small Propellers for Models, 10-16 in. dia.	$5.00

COPY OF LETTER RECEIVED FROM MR. CLIFFORD B. HARMON



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NEW YORK

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Under the auspices of the Aero Club of St. Louis there is to be an aeronautic show held in the Mammoth Coliseum Building that city, opening at 7 P. M. Thursday night, November 17th and continuing each day thereafter from 11 A. M. to 11 P. M. to and including November 24th.

This show will be for the exhibition of air-craft of every description, accessories, etc. The purpose of the Club in holding this show being to stimulate interest in the whole aeronautic field, as well as to exhibit the progress already made in man's conquest of the air.

The show is to be run on the co-operation plan, as follows:—All exhibitors will pay a certain sum according to the space they occupy, admission is to be charged, then all revenue is to be added together, expenses deducted and the balance distributed pro rata among the exhibitors according to the value of the space they use. Exhibitions by manufacturers or dealers whose business is allied in any way are solicited. Address

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All six sections have been engaged for the entire Winter by members building or buying aeroplanes.

They come from various sections of THE THREE STATES—Eastern Pennsylvania, Delaware and Southern New Jersey.

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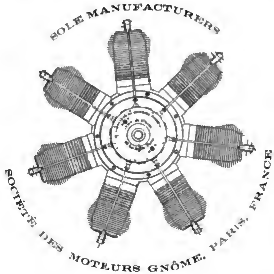

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50 H. P., Weight 167 lbs.

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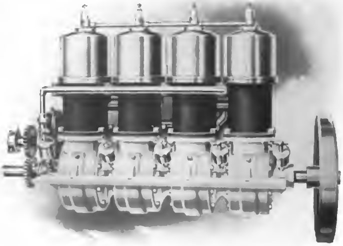

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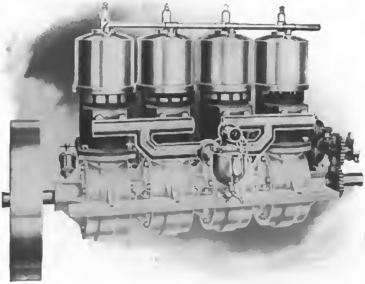
My machine was driven through the air at a rate of speed I had by no means anticipated. The effect on my nerves of this feeling of speed and reserve power I can compare only to the exhilaration produced by a strong cocktail.

I have used several different motors in my other machines, and to-day I am more than ever convinced that the Elbridge "Featherweight" is the ONLY real flying machine engine on the American market.

Cordially yours, (Signed) WM. GREENE.



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Vol. 1 OCTOBER, 1910 No. 8

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CORTLANDT FIELD BISHOP,
President of the Aero Club of America and the man who made possible the International Aviation Meet to be held at Belmont Park this month, by advancing the expenses of Glenn H. Curtiss to the Rheims Meet in 1909. He will arrive back from an extended European tour about September 29.

LEWIS D. DOZIER,
A famous pioneer in the aeronautical movement, who was four times elected President of the Aero Club of St. Louis, which position he resigned recently in favor of Albert Bond Lambert.

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AIRCRAFT

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LAW AND THE AIR

By Denys P. Myers

(*Continued from September* AIRCRAFT)

NEUTRALS AND THE AIR

THE innocent bystander will be an important person in the legal lore of aeronautics. There is bound to be a much larger quantity of him than of airmen, and he is bound to acquire a grouch, tainted with jealousy, no doubt, at the escapades, deeds and misdeeds of those who take to the aerial highway. In peace or war he is entitled to some consideration, and even as a nuisance has some rights.

Individuals at first will have well-developed cases of nerves when aviators become common enough to fill the air above while on the way to work or pleasure, but they will recover from that state and, with the aid of a few lawsuits, learn to know their rights and limitations. When stability becomes an automatic attribute of air-craft, as it will, aviators will be following the course of streets quite in the same way that vehicular traffic has for centuries, and the pedestrian will doubtless acquire a new code of swear words with which to berate the airman, who, flying low, splashes the landscape with oil. In those days the legislators will determine whether a man has a right to cross the street without casting an eye upward, how far he should stand from under to be free from the imputation of contributory negligence in case anything happens, and finally what scale of fines shall be imposable upon sky pilots who scorch so as to throw oil or cut up didoes to the detriment of the piece—or is it peace?—of mind of the ground sticker.

It is pretty generally admitted that statute laws follow their own sweet will, containing as much or as little as their sponsors have been able to secure by log rolling, swapping votes, and other tricks of the legislative trade. It is also more than probable that the case of the innocent bystander will interest the solons long before the courts have had an opportunity to apply the general theory of the law to such peccadilloes as have been enumerated, so that it is fairly futile to attempt any forecast of what rules will have to be abided by in these cases.

Another sort of innocent bystander is the unconcerned state in matters of war and peace. The war status offers some particularly definite situations. Time was when every country was a probable party to a war, but conflicts now have been reduced to a ring combat. An aggrieved few go within the enclosure and mix it up while all the other states look on and insist that their interests not be interfered with, nor their toes, territory nor commerce be stepped on or affected. In any war the neutral states predominate, furnish the cash and hitherto a good deal of the armaments and munitions,—not officially, but by that subterfuge whereby the individual makes a dollar by the deal and the government fails to refuse it as a legal tender.

One of the first sweeping changes the advent of air-craft will bring about in hostile relations is to make the belligerents more nearly independent of foreign supplies for aerial work. The Wrights already have factories in the United States, England, France and Germany, and doubtless will increase the number. Chiefly, however, it is to be noted that, whereas warships, armament and ordnance are elaborate constructions, requiring extended periods for building and a large amount of material very restricted as to sources, aeroplanes and even dirigibles, while delicate to manufacture, require comparatively little material, and that, in great proportion, of a nature very widely distributed in area throughout the world.

Under these circumstances, every state will be independent in a very large degree of neutrals so far as its fleet of war air-craft is concerned. At this moment, without any preparation toward that end, any of the powers could build a hundred aeroplanes out of materials normally in the national stock. The importance of this fact lies in its tendency to free neutrals of the temptation to engage in contraband trade, enabling belligerents to be more nearly self-supporting in a department that many of us now believe will alter the whole character of hostile strategy.

Conditions under which belligerency is prosecuted remaining as they are, it is unlikely that any warring state would go to the trouble of making its own flying apparatus when it could be imported. For while a non-participating state is forbidden officially to provide war materials to a belligerent, its nationals are entirely free to engage in any trade they please, the only risk being that pertaining to contraband goods. The liberty recognized in the matter was illustrated when the Franco-Prussian war broke out in 1870, and the belligerents were able to purchase from an American firm surplus arms and ordnance, relics of the Civil War. A Congressional investigating committee decided that no unneutral action had been committed, although it was fairly understood that the government's sale of the materials at that time was designed to place the arms and ordnance into the hands of the French and Germans, although the original purchasers were dealers in such implements.

The state that becomes an innocent bystander in respect to a war will doubtless acquire quite a collection of enemy air-craft, unless aviators learn to defy the weather to the limit of its ferocity. It is a recognized principle now, for both land and sea forces, that if a belligerent enters neutral territory he is to be interned, or impounded, for the duration of the conflict. The case of the Russian warship Lena, which was laid up at San Francisco, will occur to many. In respect to naval vessels, a period of twenty-four hours of grace, or longer in special instances, is granted an enemy ship to make necessary repairs or to take on coal sufficient to carry her to the nearest home port. If she remains after that time, she is interned, usually by partial dismantling, unless the state owning the port is an ally, as was France in the Russo-Japanese fracas; in which case, you wink hard.

Even with the science of aviation developed to the ninth power above its present status, it is likely that numerous landings will have to be made on one pretext or another during extended operations. So, applying the principle of internment, we may expect to see whole fleets of machines hung up in neutral towns. The question of a period of grace will have to be decided, and will prove a tough problem. For, presumably, aeroplanes will be of the utmost importance to warlike activity, and this consideration, coupled with their freedom of movement and the fact that they will in every case descend comparatively near the theatre of war, together offer a bunch of nuts that will be very difficult to crack. It would obviously be too strict to intern a craft because of any of the minor motor troubles that require only a minute to fix.

This is in disagreement from Fauchille, who holds that enemy air-craft landed on neutral territory should be permitted to leave it, provided that enemy craft may not leave the same neutral point together, the one being held until the other has left the neutral atmosphere. The Institute of International Law, to which Fauchille reported, does not now accept his document *in toto*, and at its next meeting will receive a revised report on aerial law, so that he may be overruled at that time on this point. He attempts to assimilate the rules for air-craft to maritime law, and there is a growing belief that such is not the proper solution, except by general analogy, on account of the aeroplane's dependence upon the motor for sustentation.

Neutral territory will be a veritable harbor of refuge for sick and wounded airmen, who, as all belligerents in similar condition, are a paramount care in war. No question will arise as to the propriety of landing them, and it will be readily agreed to permit the air-craft burdened with them to proceed from neutral territory after leaving them.

If the Fauchille idea of a neutral zone prevails, aircraft in good condition would be entirely free to manœuver above a neutral state at a height of 17,056 feet (5,200 mètres), or twice the vertical range of cannon. Also he figures that operations should be prohibited horizontally from the boundary, setting the distance at the ordinary range of field artillery, which he puts at 6.835 miles (1,000 mètres), a figure now far too low.

The idea behind these precautions is good: to keep down the temptation of aiming at air-craft when they are in a position from which stray ammunition would fall on the neutral territory.

On the other side, the ease of carrying contraband and the added danger of traversing the theatre of war by aeroplanes rather than by other means of locomotion make it advisable to lay down some guiding lines for innocent bystanders who have to be in the vicinity, or who find it convenient, at any rate, to cross the field where the shooting is going on. It is easy to determine a proper rule. The neutral air-craft, public or private, should not land until it receives authorization; and, because its state is at profound peace with the one engaged in hostilities, it should be subjected only to those special regulations necessary to provide for its own safety and to prevent abuse of its situation.

There is another kind of innocent bystander, the person who attends an aviation meet. Should the onlooker at a sporting event whose principals are refused as risks by insurance companies, be entitled to collect for damages even the price of admission? The question has arisen from a suit instituted by a person injured when Brookins fell at Atlantic City, and it is a court that will decide the matter.

(To be continued in November AIRCRAFT.)

A MONTH IN FRANCE: LETTER FROM G. F. CAMPBELL WOOD

DEAR MR. LAWSON:

Had I ever any reason to doubt the stupendous importance which the aeronautic movement is assuming here in France, the few weeks just spent here would have fully convinced me of it.

There is no gainsaying the fact that aviation is the question of the hour and it is hardly too much to say that it is the topic of general interest most often broached, whether among friends or among chance acquaintances. Almost everyone one meets is more or less of a "compétence" and has views of his or her own on such questions as the relative merits of biplanes or monoplanes, of ailerons or wing-warping, of forward or rear elevators, of flat or curved planes. This is especially true of the younger element, and it is very evident that in France at least, the technique of flying will hold no secrets for the coming generation, the active imaginations of which have been fired by the recent developments and the almost limitless possibilities they suggest.

One of the first things I did on reaching Paris was to take a stroll along the Avenue de la Grande Armée. Fifteen years ago, when in the throes of the bicycle craze, I used to do this, examining critically the countless glittering wheels in the endless row of shops, detecting every novelty or improvement carried out on the latest models, joining the crowd of "badauds" gazing with a certain awe at the dust-covered machines on which some celebrity had pedaled his way to added fame over the high-roads of France.

Ten years later, there were still a great many bicycle shops on the Avenue de la Grande Armée (there are still, for never was this industry more prosperous than it is at the present time, with the bicycle become an object of general utility in France after being a sport and a fad), but in most cases the "bécanes" had made way for the "autos" and it was the inspection of these which now interested me; I forgot the thousands of miles wheeled over the roads of Europe and the countless hours of exhilarating and arduous sport derived from the racing and touring; it was no longer Gladiator, Clément or Humber, but Panhard, Mors, de Dietrich which concerned me as I once more compared the points of the vehicles exposed before making a choice.

And now I returned to the Avenue de la Grande Armée wondering if I would find what I had the audacity to hope to see there: an aeroplane shop. It appeared almost before I had expected it, and the sign "Farman Frères Aéroplanes" showed up within a few steps of the Etoile on my way towards the Porte Maillot; the windows revealed propellers and every conceivable accessory to flying; it seemed natural that Henry Farman, famous as a cyclist, a motorist and an aviator should be one of the first to figure on what will soon be the Aeroplane Row of Paris after having been its Bicycle Row and Automobile Row.

Going in, I found myself face to face, not with Henry Farman but with his brother Maurice, which shows that the news of their reconciliation was perfectly correct notwithstanding their actively rival biplane factories. ("Farman frères" stands for Henry and Dick Farman and is entirely distinct from the firm of which Maurice Farman is a member.)

I asked if the flying schools at Buc (Maurice Farman) and at Mourmelon (Henry Farman) could be visited and was cordially invited to do so.

There is as yet but little personal rivalry between the various makers who, as fraternal co-operators towards the triumph of a Great Idea, have so far stood shoulder to shoulder in the first phase of the struggle: the overcoming of the natural hostility of Public Opinion,—to so new a thing as aviation.

This was most apparent at the monthly dinner of the Aero Club of France, given that very evening at the Carlton Hotel, where were gathered many of those who have made the present great successes possible:—the enthusiasm—the enthusiasm of toilers long disappointed and ridiculed who see the first signs of their ultimate triumph—and the good-fellowship and free exchange of ideas among those popularly supposed to be the keenest of rivals, formed the most exhilarating atmosphere imaginable and one in which the most sceptic terrestrian could not fail to become a believer in the ultimate triumph of air-travel. The hero of the evening was Louis Paulhan, who had just been decorated by the French Government; my right-hand neighbor proudly commented on the meteoric career of Paulhan—who not many months ago was a mechanic earning fifty francs a week—explaining that in the new industry every man had an even chance, even in the Old World. Paulhan, the ex-mechanic was toasted by the Comte de la Vaulx, the thorough sportsman who still holds the world's distance record for ballooning and who has done so much to get the French powers-that-be interested in Aeronautics.

I had not seen Paulhan since his disappearance from New York last March; he was most interested to learn of American doings and especially of the progress and prowess of Clifford Harmon on his old record-breaking Farman.

One who was being congratulated on an early recovery from what might have been a very bad accident was Captain Etévé. Etévé is the only man who holds pilot licenses for all three branches of aeronautics—spherical, dirigible, aeroplane, and is thought very highly of, both as a technician and as a demonstrator. He drives a Government Wright, on which a few weeks ago one of the chains snapped; this same accident happened to Wilbur Wright in November, 1908, but he instantly shut off the power and was able to bring the machine down on an even keel; it also once happened to the Comte de Lambert when he was running along the ground; in Captain Etévé's case, the biplane was some seventy feet up and the aviator was unaware of the breakage when it occurred; the machine under the propulsion of the remaining propeller started, of course, to turn and tilt sharply, but luckily the broken chain swung round the other chain and stopped it; the machine landed sideways on a wing-tip, pivoting around and throwing Etévé out, without, however, much damaging him. When I asked how it was that such an accident could occur with chains tested far beyond the strain required of them, he shruggred his shoulders, saying: "On ne sait jamais, avec les chaines," whereupon Archdeacon, who was present, declared he was going to try a Wright with a single propeller!

Like almost everyone in Europe who flies a Wright, Etévé has adopted a rear horizontal stabilisator to his machine but unlike the fixed stabilisators such as the boxkite of Englehard, the small plane on Rolls' Short-Wright at Nice, the small horizontal vanes between the vertical rudders used on Ollgivie's machine, those of some of de Lambert's machines and those used at College Park and Dayton, unlike also the rear horizontal rudders used both in America and Europe (notably on the machine in which Rolls was killed) Etévé's stabilisator is neither fixed nor hand-controlled, being two hinged surfaces dependent on a vane. He claims to have acquired much automatic stability from the contrivance, the dipping of the biplane being much diminished and the strain on the aviator much relieved, whilst no hindrance is noticed when purposely rising or descending.

De Lambert then spoke of the experiments he had made to test just how far the wing-tips could be warped with efficient results, and said the limit where the lifting effect was entirely superseded by the retarding effect, was quickly reached.

While at this dinner, I arranged with M. Clerget, (whose motors have carried several Hanriot monoplanes to success) and Mr. Blin—of Maliect & Blin, the motor truck builders—to take a balloon trip with them the following Sunday, and on the advice of Mr. Lahm, who represents America so ably in French aeronautic circles, applied to Mr. Mallet for the balloon. This was for August 7: on Saturday, 6, I went to Issy-les-Moulineaux to see the preparations being made for that greatest of all aeroplane races to date, the Circuit de l'Est, the start of which was scheduled for the next morning at five.

I had never been to Issy, the scene of Farman's early triumphs, of the winning of the Deutsch-Archdeacon Prize in January, 1908, of Delagrange's and Blériot's first real successes, and it was not without a certain curiosity and a remembrance of these feats and of many others performed there in the early months of aviation, that I passed the fortifications and came upon the great sandy expanse where so many men had acquired wings and learned to use them.

I found it a scene of seething activity; in the many hangars lining its outskirts, and in front of them, the competitors of the Circuit de l'Est were completing their preparations for the great flights across France, putting finishing touches and making final tests and examinations of aeroplane and engine; a continual roar of engines and propellers at work—with the not-to-be-mistaken note of the Gnômes predominant—filled the air, whilst monoplanes and biplanes tugged and strained at ropes or dynamometers, or were held in check by their crews.

In the huge dirigible-sheds many aeroplanes were quartered whilst aviators and makers saw that nothing was overlooked which might contribute to ultimate success.

Many machines were there also which were not entered in the big race: those of men just learning to fly or those, less familiar in appearance, which embodied new ideas and were receiving their first trials at the hands of their originators.

Although the scene was one well calculated to fascinate an enthusiast in matters aeronautic, I got away at five in order to motor to the Maurice Farman School at Buc: as I left Issy, I noticed some of the crowd pointing skyward towards the north, where the Eiffel Tower stood out beacon-like above the grey sea of the roofs of Paris: I saw that they were looking at a bird soaring in the distance and my first glance made me instantly share their suspicion as to the character of that bird—a suspicion which a moment later became a certainty as it quickly revealed its true nature. A monoplane was flying towards us, far above the chimney pots and gables of Paris and the wide, square-tipped wings quickly proclaimed it an Antoinette—the first I had ever seen in flight.

A few moments later the magnificent machine was roaring over our heads to the frenzied delight of the crowd: a beautiful glide brought it to earth, and Latham jumped down, unmistakable even in the distance with his cap and rubber coat, the characteristic slouch and the inevitable cigarette by which he is known to millions who have never seen him.

He had left Mourmelon that morning but had lost his way three times in the low-flying clouds in the neighborhood of Epernay and Meaux.

Later in the evening Weymann reached Issy in a similar manner on his Henry Farman of the latest pattern, but by that time I was at Buc, beyond Versailles, at the very busy flying school of Maurice Farman. A long row of sheds stands out from the road and each contains one of the speedy biplanes, most of them Government machines undergoing trials and tests. Five or six were taken out in the course of the evening and several officers given lessons, Maurice Farman, Tabuteau and Barra, who, with Renaux, are the best drivers of these machines, making flight after flight.

I was one of a few watching the great planes swooping and circling like big bats in the waning light, when near the horizon and more to the north we noticed a greyish speck standing out in the distance against the deepening blue of the evening sky and moving with comparative speed over the black tree-tops; the glasses revealed a Wright biplane flying high and straight, perhaps three miles away, evidently at Villacoublay, where the Wright School has its headquarters. This extraordinary impression of seeing machines in flight on all sides in the open country was to be increased a thousand-fold when a few moments later the distant drone of a many-cylindered motor became audible from behind the hangars and struck one instantly as different from the roar of the Renault motors of the Maurice Farmans. We all knew at that moment that an aeroplane was coming towards us from the West but we could see nothing, as we were standing before the sheds which masked it.

Only after the noise had increased so that we had recognized a Gnôme engine as being its origin, did the mysterious visitor of the skies burst into view, a Henry Farman biplane flying due East at about 200 feet altitude and making its natural speed of 45 miles an hour in the evening calm. The two men in military uniform it carried were plainly visible, the one driving, the other consulting a small square of canvas or paper which must have been a map: the biplane never stopped or wavered; no sign came from the unknown figures as they sped on their course, and they went as they had come; the biplane grew smaller and smaller, the stacatto clatter of the motor became once more a drone which imperceptibly became melded with the waning murmur of country sounds—at the hour of the Angelus—and we looked at each other almost wondering if the apparition had not been a phantom of our imagination although the faint smell of burned castor oil (!) wafted down from above clearly confirmed our visual and aural impressions.

It is hard to describe the sensation; we knew not who they were, where they came from, whither they were bound: it was a true glimpse into the future and nothing previously had impressed me so strongly of the impending change in the order of things.

Who will trouble to lift his head to see a passing aeroplane a few years hence? Who, indeed, but the man just cured of blindness or the liberated convict for whom alone the sight will be as novel as it is in civilised climes for us now.

It was only on the morrow that I learnt that it was Lieutenants Gronier and Just—practically unknown as aviators—on their way from Caen to Vincennes (125 miles): they had stopped at Evreux for lunch and were finishing an eventless trip in the calm of the late afternoon; they had chosen the sheds of Buc as one of their "points de repère" and a convenient place to halt if necessary.

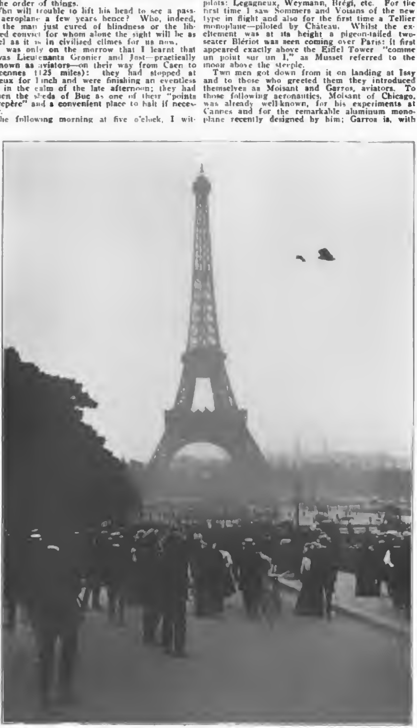
The following morning at five o'clock, I witnessed—with about a quarter of a million other human beings—the start of the Circuit de l'Est, at Issy.

Paris, which usually stays abed Sunday morning, got up on this seventh of August in the middle of the night and set out for Issy, and at four o'clock, the first signs of dawn found the streets in southwestern Paris filled with a hurrying mob of pedestrians and vehicles: the crowd at Issy was truly colossal and such a one as only aviation could at this time bring together at such an hour, in France.

The start of the big race went off without a hitch, machines setting out for Troyes in rapid succession, over the lifted heads of thousands of Parisians.

The Blériots—Leblanc, Aubrun, Noël, Busson, Mamet—seemed to particularly call forth the popular enthusiasm, but the biplanes got their greeting also, especially those of the more popular pilots: Legagneux, Weymann, Brégi, etc. For the first time I saw Sommers and Voisins of the new type in flight and also for the first time a Tellier monoplane—piloted by Château. Whilst the excitement was at its height a pigeon-tailed two-seater Blériot was seen coming over Paris: it first appeared exactly above the Eiffel Tower "comme un point sur un I," as Musset referred to the moon above the steeple.

Two men got down from it on landing at Issy and to those who greeted them they introduced themselves as Moisant and Garros, aviators. To those following aeronautics, Moisant of Chicago, was already well-known, for his experiments at Cannes and for the remarkable aluminum monoplane recently designed by him; Garros is, with



FINISH OF THE CIRCUIT DE L'EST: THE GREAT 500 MILE CROSS-COUNTRY RACE WHICH FOR ONE WHOLE WEEK CREATED SUCH A FEVER OF EXCITEMENT THROUGHOUT EUROPE. LEBLANC PASSES THE EIFFEL TOWER—A WINNER OF FAME AND FORTUNE.

Santos-Dumont and Audemars, one of the few men who have mastered the caprices of the "Demoiselle" type of flyer.

Moisant was a few weeks later to be known as the first man to travel from Paris to London in a heavier-than-air machine and the first to cross the Straits of Dover with a passenger.

Leaving the crush and excitement of Issy, I made for the Aero Club Park at St. Cloud and, shortly after eleven rose in the air in the basket of the 1,200 cubic metre *Aero Club III.*, with MM. Clerget and Blin.

This is a little late in the day to give even a succinct description of a balloon trip, but however familiar and banal the impressions of ballooning may seem nowadays, nothing will ever affect the peculiar, silent, motionless charm of drifting above the clouds and gazing, as on a picture, on the stupendous panorama slowly unfolding itself seven or eight thousand feet below, the clean chess-board toy-like appearance of which makes it hard to recognize as the cultivated and built-on surface of the busy man-bearing planet Earth.

We drifted right over Paris at a height of three thousand feet—an experience which no succeeding ones could ever make one forget—and by a curious coincidence passed precisely above the Princess Hotel, where I was staying, immediately afterwards crossing the Arc de Triomphe, the Parc Monceau, the Gare St. Lazare, etc., identifying the toy buildings, miniature streets and tiny monuments in the great picture below, which it was hard to look upon as a distant reality, unless the motion of the black specks—oblong or comma-shaped according to whether they were motor-drawn or horse-driven vehicles—was observed.

Thus the panorama slowly unfolded itself towards the west, as we drifted eastward.

Soon we were over the sunlit fields of Seine-et-Marne, and the roar of Paris had become a murmur in the West. We continued rising: great fleecy vapors appeared on all sides and we passed through the dry fog of a mile-high cloud: soon this was below and we enjoyed an unusually fine vista of that ever-wonderful aeronautic treat: the sea of clouds. *La mer des nuages* stretched out its intensely white billowy mass below, whilst our shadow drifted across it with all the wonderful prismatic effects of which I had heard so much.

The barograph indicated 7,000 feet and whilst the scorching sunbeams reaching us through the pure and thin air prevented our feeling the cold where they had access, our frigid extremities confirmed the low reading of the thermometer.

After lunch—the only untoward feature of which was the sweetness of the sparkling beverage brought along!—the earth became visible again and I quickly identified the winding Marne and the cathedral and bridge of Meaux—looking for all the world like a little ornamental inkstand, and a grey penholder to match.

On our third culmination we reached 8,000 feet and I was able to judge exactly how the earth looked to Drexel when he approached this altitude in his Blériot (it has since been reached by Morane and Chavèz).

Our final descent was rapid, our remaining ballast just sufficing to check its speed.

In the last few hundred feet the earth came surging up toward us, every detail growing with bewildering rapidity; the fall was swift enough for the upward breeze to be clearly felt as we leant over, and with it came faint cries from below, cries with a strong nasal intonation, which alone would have told us the part of France we were coming upon: "Le ballon!—le ballon, qui tombe!" I waited to see the guide-rope strike and note it check our descent: we were then above some trees but we cleared them and it was into a clover field that we bumped. The church bells of Coully were merrily urging the villagers to the afternoon celebration, but our sudden incursion into their peaceful existence had diverted those who were on their way there, to our clover field, and they came running breathlessly in their Sunday-go-to-meeting accoutrements, and with the looks of wildest exhilaration on their well-tanned and well-washed countenances. The little bell stopped, the little church emptied and Monsieur le Curé himself appeared shortly, beaming with hospitality, followed by a frantically hurrying garde-champêtre, his rubicund countenance oppressed with perspiration and importance.

It was altogether a delightful day's sport.

The next day I visited the Antoinette factory at Puteaux, where Levavasseur himself, with never-failing courtesy, insisted on piloting me around and explaining the fine points of the wonderful works. To any one who doubts the mushroom-like growth of this industry I recommend a visit to one of these French factories and the roaring activity of the great shops, the great army of workers, the tremendous "bustle," the dozens upon dozens of fuselages, wings, chassis-porteurs, in every stage of completion; and the busiest and noisiest portion of all: the motors. It was a revelation, even to one deemed by most of his acquaintances an incurable optimist in aerial matters.

On leaving, M. Levavasseur asked me to visit the Antoinette Flying School at Mourmelon.

We left on the morrow for Biarritz and I did not expect to be in touch with the aeronautic world until my return north: Biarritz was having a small aviation meet of its own, however. Most of the participants were but little known, but they could *all* fly. Tabuteau, on his Maurice Farman, and Château on his Tellier, were the stars. For the first time I saw a Savary biplane in flight: Picard of Bordeaux, drove this novel machine, which first showed its paces at Rheims: the power plant consisted of two chain-driven propellers or rather tractors in front of the main planes; the vertical rudders are between the planes and the elevators at the rear of the fish-like tail; the motor: an 8-cylinder E. N. V. Later, at Havre, I was to see Picard piloting a Savary with a single tractor.

On returning to Paris on August 23rd, I went to Mourmelon by train to avail myself of the Antoinette Company's invitation.

Instead of getting off at Bouy, as I should, I alighted at Mourmelon: an omnibus took me and some officers going to the Camp de Chalons barracks, to the village of Mourmelon-le-Grand, from which I proceeded to walk, until seeing a bicycle shop I hired a wheel for the remaining two miles. By automobile is the only sensible way to get to the place, of course.

TWO-SEATER ANTOINETTE IN FLIGHT AT MOURMELON, SUNSET, AUGUST 23RD. PILOT, COMTE DE ROBILLARD-COSNAC PASSENGER, MR. CAMPBELL WOOD.

Two of the big monoplanes were just being taken out when I finally reached the long row of hangars which housed the Antoinettes.

The same bustle and activity prevailed here, in the "assembling" building, as at Puteaux, in the factory—also the same courtesy at the hands of the directors, M. Gastambide, in this instance. My great interest in all I saw had its reward, for M. Gastambide (who, you remember, built with M. Mengin, the first Antoinette, early in 1908) took me into a closed hangar, saying, "I want to show you what we hope to bring the Gordon Bennett Cup back to France with," and he pointed at a splendid 16-cylinder engine on a testing bench. This was indeed interesting, as, outside of one of the early Blériots, no aeroplane had flown with a 16-cylinder Antoinette, which had only been tried in motor boats.

Evidently Latham and his associates have determined to wrest from the all-conquering Gnôme-Blériot its speed laurels,—and they recognize the obvious incapability of their standard 8-cylinder model to do so.

The racing Antoinette is to have smaller wings with the same curve, but set at a slightly different angle; they count on 125 kilometres an hour, which of course is necessary if they want to beat the 14-cylinder Blériot. Whether this latter machine—the Blériot—can go 100 kilometres at a stretch is, however, an open question up to this time. It is thought in many quarters that the rear set of cylinders are too masked by the forward set to keep adequately cool and it is a fact that this racer has never flown ten miles at a stretch and that the 14-cylinder Gnôme-Farman of Van den Born didn't do anything at Rheims.

With the Séguin brothers it is well to be optimistic, however; their 100-h. p. engine may well turn out to be as good as their 50-h. p., and this is not saying little.

Latham and Lafont were absent from Bouy and the only Antoinette pilot flying that afternoon was the Comte de Robillard-Cosnac, a new comer, who in the previous few weeks had become a true bird-man. He made two or three beautiful flights in a one-seater monoplane, finishing with finely judged vols planés; he then took out a two-seater, taking up a pupil, who inadvertently shut off the engine. Luckily the monoplane was at a good safe height and was brought to earth in masterly style. It was a fine piece of airmanship (as the "Daily Mail" would say!)—and one which called forth commendation from those present.

It so happened that I was immediately afterwards to experience the exhilarating sensation of a first flight.

My flight with de Robillard amply repaid me for the long journey to Mourmelon, and it was certainly satisfactory to have one's first taste of flying, in a monoplane, and in the most bird-like of them, at that.

Two-man flights in monoplanes are so far unknown in America (although Harkness can inaugurate them at any time with his two-seater Antoinette), but they are quite usual in France.

The sun had already set when we went up but there was ample light to fly by; neither were we alone in the air; three Farmans from the near-by school were likewise soaring over the famous plains—one of them far above us—and below a small Koechlin monoplane was being run over the ground by a would-be *aviatrice*: Madame Niel.

The actual sensations of flying have been described so many dozens of times that I am not going to make my first experience in the line an excuse for inflicting upon you an addition to the collection of "impressions." I will hazard the opinion, however, that even when flying has become the most ordinary thing in the world, each individual's first experience will still remain one of the greatest and most easily recalled of his life.

The constant roar of the engine and the onrush of air, the difficulty of gaging the first moment of flight or the height at which you are flying, the illusion, when you are well up, and the ground appears to be slowly passing below, that you are facing a strong wind which is holding you back and making you move but slowly,—can be imagined, but the almost ludicrous sense of security cannot: it is in fact out of all proportion to the actual security (however great that may be), for you feel as if nothing could affect the structure carrying you irresistibly through the air.

As the key-note of ballooning is absolute peace and quiet that of flying is energy let loose and,

FRANCE'S FAMOUS AVIATOR, HUBERT LATHAM AND HIS LATEST ANTOINETTE IN FLIGHT. LATHAM HAS FLOWN THOUSANDS OF MILES ON THIS AND SIMILAR MACHINES. HE WILL DRIVE ONE IN THE GORDON-BENNETT CUP RACE AT BELMONT PARK, NEW YORK, THIS MONTH.

to the novice at least, is certainly intoxicating in its exhilaration.

We were up ten minutes, most of the time 150 feet; the clamor of the eight cylinders did not prevent a running conversation throughout the flight and as we came back towards the hangars I asked de Robillard if he would land "en vol plané," but he said he thought we were not quite high enough at that time.

The flight, banal as it was (in these days), would two years ago have constituted a world's height record and passenger record for any type of aeroplane and a monoplane record for duration!

Such is the march of progress.

Thanks to an obliging man who took me down to Bouy station in his car, I just caught the train for Rheims and thus, what with horse-drawn omnibus, walking, cycling, flying, motoring, and railway, I indulged in six different forms of locomotion within a couple of hours.

I had an hour in Rheims, to dine, before going on to Paris. I suppose Rheims might be called the present aviation-centre of the world; all the great flying schools cluster around the old town, in the neighboring plains, and Rheims is the rendezvous of all aviators and would-be aviators. There are many hotels there, but *the* hotel is the Lion d'Or; last time I was there was four years ago: I was motoring from Brussels to see the start of the first aeronautic Gordon Bennett Cup, the balloon race won by Lieut. Lahm, and stopped there for lunch. At that time flying was considered more or less as a dream—although in that very month Santos-Dumont had got off the ground for a few seconds, at Bagatelle,—and the practical Rémois would have been more amused than startled if the character of their town as a flying centre in A. D. 1910 had been prophesied to them.

From Paris I went to my old home at Havre, and, as an official at the meet which began there August 25, I had a very welcome opportunity to see how those things are got up and run in France. The organization was perfect and made me forget my disappointment at Bournemouth.

The only accident was a bad fall of the popular Legagneux, who hit a pylon, either through inattention or because of a broken rudder wire.

The biplane was smashed to kindling wood, part of it remaining clinging to the pylon. Legagneux seemed to be badly hurt but he soon recovered and was present at the aerodrome a few days later.

The Havre-Trouville flights across the estuary of the Seine (11 miles) were extraordinarily successful. This wide expanse of tidal water was crossed *eighty* times in three days by *nineteen* different aviators on *seven* different types of aeroplanes without one machine having to come down in the water and without the smallest mishap. Most of the motors were, of course, Gnômes or Antoinettes, but Renault, Clerget and Labor Picker motors also carried machines across in safety.

Latham, the winner of the contest, crossed sixteen times in the three afternoons!

My father has a boat, a thirty-footer, and we went right out in the estuary, exactly on the line of flight, where we were quite alone and several miles from either shore; during the hours set for flying monoplanes and biplanes roared over our heads in a continuous procession, some so near that it would seem they would carry away our topsail, whilst others soared by a thousand feet up.

I have never seen flying under such an inspiring and thrilling aspect.

Our Breton crew (man and boy) were lost in wonder as well they might be. At one time three outgoing Blériots (Morane, Leblanc, Mamet), met two incoming Antoinettes (Latham, Wincziers), the five monoplanes whizzing by all in the space of two minutes.

Morane made the fastest crossing: 63½ miles an hour—with a five mile wind to help him.

When Latham finally bade goodbye to Havre on his last trip to Trouville—(yesterday, September 1,) he flew over the town to the house of his uncle to wave au revoir to his cousins; turning from there he passed right over our house, which is just beneath the Lathams; and plunged down the slope, sailing over the town and port and out to sea towards Trouville.

We were over at Trouville to-day; the aerodrome of Deauville was merely the race track in which six posts had been stuck; the course was only a mile around, yet the more skilful pilots rushed around the dangerous little track, within a few feet of each other, and a few feet over the heads of such an ultra fashionable crowd as only Trouville can provide.

The most interesting machine at this meet was the little Goupy biplane which, unless all signs fail, has a great future; it was one of the revelations at Rheims in June and bids fair to challenge the monoplanes' recently acquired superiority in starting and handling.

The high flying by Morane and Latham—probably the two greatest monoplane-drivers in the world was magnificent. On a perfectly clear day Morane rose up into the blue in wide spirals, until it became quite impossible to see him.

What with Drexel, Chavèz, Morane, Olieslaegers, Tyck and Cattaneo, the Gnôme-Blériots seem to have matters their own way in high climbing.

I have been delayed in finishing this letter: I am following it across the Atlantic and will see you in a few days.

Sincerely,

G. P. CAMPBELL WOOD.

Havre, September 2, 1910.

Letter from Geo. A. Lawrence

In your issue of AIRCRAFT for July there is an item to the effect that Mallard, a mechanician for Clifford B. Harmon, has invented keels below planes, to prevent skidding.

A description of my 1908 aeroplane in which I used skids covered to act as keels to prevent skidding, was published in April, 1909.

I corresponded with Mr. Octave Chanute on the subject, and have a letter from him still in my possession, stating that with such an arrangement, I might have some trouble in making turns, owing to the numerous keels. He was right and I reduced the number to four, two under each plane, using the lower skids for the lower keels. I find in experimenting that this reduces the skidding considerably, the more keels being used the less the skidding, but the more difficult to make the turns and the less the number of keels, the easier the lateral steering, but the more the skidding.

I found that keels below used alone do not act as well as keels under each plane, so I adopted the latter arrangement in my machine of 1908-9.

Again, I note an English patent by the Wright brothers on a small rudder, vertical, fixed behind the planes, one on the right and one on the left of the machine, to operate in conjunction with their warping wings, instead of the main vertical rudder. I used that system in 1906 successfully.

I am constructing my fourth machine and I am using my 1908 keels with front and rear lateral control in conjunction. The front and rear elevator control is separate. This is to be in readiness in case of a situation arising such as resulted in the fatal accident of Rolls.

I use ailerons at the rear side of my planes, extending beyond with my right and left retarded as on my No. 3, which operated in conjunction with the aileron automatically, by an electrical gyroscope, a system which I have perfected after working on it for two years, and of which I made my first successful tests May 19, 1909. This is the only part of my machine which I am having patented, because this control can be used on any type of flyer.

Also, I note in your August issue, page 217, a sketch of a method of joining the uprights to the main spar. This is the same identical method which I used on my 1908 machine, which stood at Morris Park all last summer, where it was inspected by thousands of visitors.

I trust you will publish this letter or parts of it, to let Messrs. Harmon and Mallard know that these devices are old with me, and that proof of my statements can be found in various newspapers and periodicals which I can refer them to.

AN AMERICAN'S FEAT ABROAD. JOHN B. MOISANT, OF CHICAGO, AND HIS MECHANICIAN, WHO MADE THE FIRST TWO-MAN CROSS-CHANNEL FLIGHT.

EVOLUTION OF THE CURVE

By Edward H. Young

THE curves in the surfaces of an aeroplane are vital and play a most important part in its success, irrespective of whether it is a monoplane, biplane or multiplane. As too little attention has been given to the curve by the general aeronautical world and especially by amateurs, to whom this article is addressed, it is hoped that in the future more scientific attention will be given this subject. Amateurs, in starting out, make the fatal mistake of going after speed, instead of going after lift as they should do. "Head-resistance" is not the big "bugaboo" that most amateur aviators imagine, and a deep curve of scientific build giving a powerful lift (even if not with so much speed) is far preferable to learn to be proficient and expert with, than a shallower and speedier curve. Besides, a deep curve has the advantages of being easier to manipulate, easier to keep in balance and easier to get off the ground witb, than a shallow curve. Then, too, professional aviators have at their command complete and well-equipped laboratories, built for the express purpose of digging these little refinements out, which can only be speedily found after practical knowledge has been obtained by the aviator. Most amateurs will find that it will take the third construction at least before success will begin, generally because they go for a shallow curve that is not properly built and angled.

The evolution of the aeroplane curve has been so minute and apparently so insignificant, that the general public has failed to notice its really remarkable development. Take Figure I., for instance—the straight-plane cutting edge. First experiments were tried with this device to find the amount of "head-resistance" developed and to find the amount of resistance developed from what has become to be termed "skin-friction." All of the early experimenters, Stringfellow, Maxim, and Langley, tried for this knowledge. Probably Langley's device was the most accurate, comprising a rotating table with a collapsible arm holding a straight-plane cutting edge of a given area at a given speed and circumference. It was finally found that about 256 square feet of skin-frictional surface at about thirty miles an hour speed developed about one pound resistance. It was also found that cutting edges with straight surfaces and sharp angles developed just about double the resistance of a cutting edge with a spherical surface; and again a cutting edge with an elliptical surface has just about half the resistance of the sphere.

Figure II. shows the next stage in the evolution of the curve. This is simply a straight plane thrown at an angle to the line of flight. Experiments were made with this to develop the lift and resistance at different angles to the line of flight. It was found that the maximum lift with the minimum head-resistance was had with the angle of the plane thrown at about 36 degrees above horizontal. The best lift, however, that has been developed with a straight-plane thrown at an angle of incidence, as it has become to be called, is had only with the box kite. Seeking for the reason of this it was found that air rebounds from a flat surface at right angles to the line of impact, the same as light-waves rebound from a looking-glass. Therefore, there was not any grip of the plane on the air.

Therefore, the true arch of a sphere was next introduced as shown in Figure III. With this curve, the feat of lifting a man was accomplished. This was accomplished primarily by the fact that the air was not thrown off at such a sharp angle as in the straight-plane device. This arrangement allowed of the air being compressed more and more to the rear of the aero-curve (as it should properly be called). Or, in other words, it allowed of the aero-curve catching a good sound grip on the air underneath it.

The next improvement was a discovery made about the front curve, as shown in Figure IV. Curving the front portion rather abruptly down, and thus making the surface a parabolical rather than a true curve, caused the air to be shot upward. The air underneath of the plane then shot in to fill the vacuum thus formed. This rushing air being suddenly stopped by the under surface of the aerocurve, a powerful lift was obtained.

The next point of evolution was the remarkable discovery made, that if properly constructed, the upper surface of the plane has as much lift as, if not more than, the under surface gives. This was obtained by reverting to our old construction illustrated in Figure II., and abruptly bending the front portion down until it was absolutely vertical to the line of flight (illustrated in Figure V.). By this construction the air was abruptly thrust vertically upward, while the air rushing in underneath to fill the vacuum gave a powerful upward thrust as it hit the aero-curve, and was in turn pushed forward towards the butt-edge, thus assisting to overcome the head-resistance. But the most important point was found in that the air that was shot vertically upward by the butt-edge of the aerocurve endeavored to carry the aerocurve with it, giving an upward action as strong as the thrust underneath. This action is best illustrated by the following: Take a piece of writing paper cut 6 inches square and fold a flap of one inch underneath. Insert this flap inside the closed cover of a book. With the flap-edge held directly in front of the mouth, blow directly upon the paper. You will find that as you blow *directly* against it, it will rise up until it even hits your face. This will prove to you that the upper surface plays an important part, as by sticking one edge in the book, it is absolutely impossible for air to get to the underside.

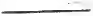


Fig I.

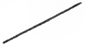


Fig II.

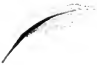


Fig III

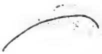


Fig IV

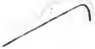


Fig V.

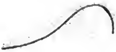


Fig VI

Figure VI illustrates an improved curve based on this principle. In this construction the front portion is composed of a true quarter circle, while the rear portion is a shallow inverted curve. Be careful that every portion of your curve is concentric and that there are no abrupt curves or angles in the surfaces, for otherwise you will get a resistance without getting an upward lift. In this construction just mentioned, the upward thrust obtained from underneath is accentuated forward to overcome head-resistance, while the suctional sweep on the upper surface is lengthened so as to give greater lift.

As advised before, amateurs are urged not to try for high speeds through the help of shallow curves, but to go for slow speeds and deep curves with high lifting powers on their first machines—say 30 or 35 miles an hour. Your equilibrium will be easier to maintain, you will learn easier and gain confidence quicker, and you will be safer if your engine should happen to stop running while you are in the air. Besides this, you can get off of the ground three times as often, which is very encouraging to a beginner. Always try with the latest standard improvements in aerocurves, as it will save you a lot of experimenting.

SOME CONSTRUCTION DETAILS

By W. H. Phipps

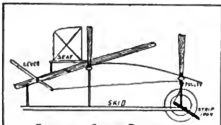


Fig 1—New Curtiss Brake.

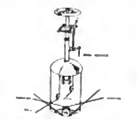


Fig2—BLERIOT CONTROL

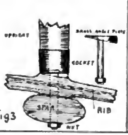


Fig3

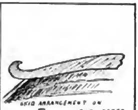


Fig. 4.

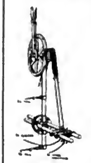


Fig 5

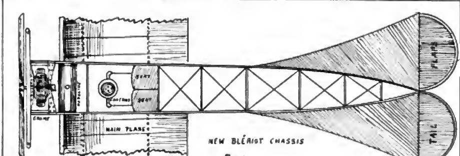


Fig6.

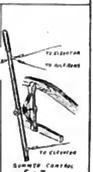


Fig 7

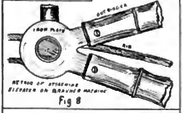


Fig 8

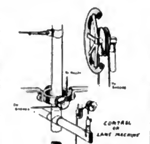


Fig.9.

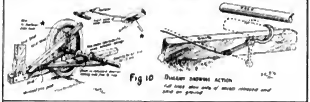


Fig 10

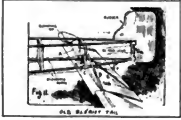


Fig11.

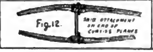


Fig.12.

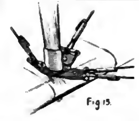


Fig 13.

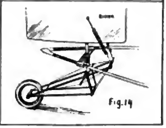


Fig.14

Fig. 1—Illustrates a new brake fitted to the Curtiss machines. It consists of a piece of strip iron bolted loosely to the skid and connected to a hand lever as shown.

Fig. 2—Shows the Blériot control. Pushing the wheel forward or backward, lifts or depresses the tail; pushing it sideways, warps the wings. Steering to the right or left is accomplished by a foot tiller.

Fig. 3—Shows an angle plate, fitted to the Harris biplane at Mineola. The object being to have the upright set perpendicular on the rib.

Fig. 4—Illustrates the wooden skid fitted to the end of the planes of the Harkness Antoinette monoplane, now at Mineola.

Fig. 5—Shows a steering column used on the Pointer machine.

Fig. 6—Shows a sketch of the new Gnôme driven Blériot fuselage, showing the flat tail, position of the motor and the two seats.

Fig. 7—Illustrates the Sommer control lever.

Fig. 8—Shows the elevator joint used on the Brauner biplane at Mineola.

Fig. 9—Shows the method of control used on the English Lane monoplane.

Fig. 10—Illustrates a method of attaching release wheels to a Wright type machine.

Fig. 11—Shows the tail used on the Blériot cross-channel type monoplanes.

Fig. 12—Shows how the skids protecting the ends of the Curtiss planes are attached.

Fig. 13—Illustrates a joint used on the English Short machine.

Fig. 14—Shows a novel tail wheel fitted to the George and Jobling biplane, England.

We are indebted to the London magazines "Aero" and "Flight" for several of the originals shown here.

NEW FLYERS DESCRIBED

THE CROMLEY MONOPLANE

By John M. Cromley

This monoplane is of the Santos-Dumont type but is built much stronger and has several new and original features, one of which is a box tail that controls four directions—the only monoplane, perhaps, in the world, with this kind of a tail. The machine also has ailerons at the rear of the wing tips to maintain lateral stability.

The main plane has a total span of 20 feet, with a fore-and-aft chord of 6'6"; the overall length of the machine is 19'. The ribs are of one piece with a special curve; the under sides are covered with Naiad aero cloth.

The total supporting area of the main plane is 117 square feet, and the complete machine without engine and propeller weighs 90 pounds. The machine is constructed throughout of spruce and is braced with piano wire.

The tail is of the popular box type, but is supported in a different manner than is usual. It is hung on a universal joint that permits it to move in different directions.

The fuselage is of triangular shape with two of the angles at the top; they are braced with suitable stanchions and trussed with piano wire. The three members extend rearwardly, approaching each other but not joining together, and form a holding for the universal joint that supports the tail. At the front of the fuselage are attached two wheels that support the machine, and these are braced by suitable members that extend from the fuselage.

The horizontal rudder is 4x3 feet in size and is of the biplane type with a gap of 3 feet. This rudder is composed of the top and bottom of the box tail.

The vertical rudder is 3x2 feet in size and forms the two vertical partitions of the box tail.

The running gear consists of two 20x2 aeroplane wheels in front, and a skid in the rear. There are no shock-absorbers on the wheels.

The control is effected with a wheel as used on the Curtiss machines and controls both the horizontal and vertical rudders.

Ailerons are attached to the rear edge of the main plane and are 3x1½ feet in size; they are controlled by shoulder forks.

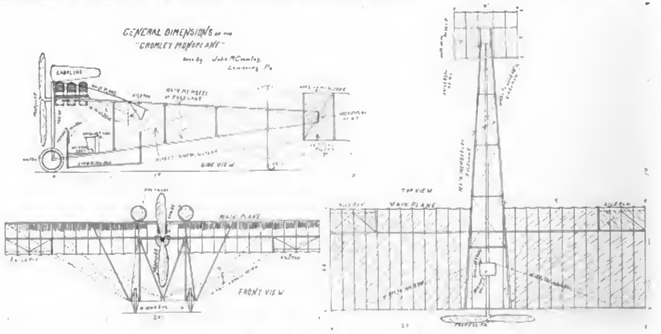
The seat for the pilot is beneath and back of the motor and is on the lower member of the fuselage, which position gives him good judgment in making landings and for general direction.

The motor is mounted on the two upper members of the fuselage at the front, which form a solid bed for the engine; this counteracts the low position of the pilot.

The writer has been experimenting on heavier-than-air machines for over three years, having built numerous models and several large machines. He has also invented an anemometer that can be made by anyone at a very small cost.

This monoplane will shortly be put on the market for the sum of about $800. Several have already been disposed of, minus motors, to various parties in New York.

TAIL-END VIEW OF CROMLEY MONOPLANE.



FLYING MACHINE MODELS

By W. H. Phipps

At the recent Sheepshead Bay Meet, held at the Sheepshead Bay racetrack, Long Island, there was an exhibition of model and kite flying.

The exhibitors were boys of the Junior Aero Club and Public School No. 77.

For the benefit of those who take an interest in model making and flying, we publish below a list of the distances flown recently at an English model contest, the Gamage Cup contest:

First—Twining, 708 feet.
Second—Burge-Webb, 378 feet.
Third—(Unknown competitor), 318 feet.

These figures are official and show that America is far behind in model flying, the American official record being 215 feet made by Frank Schrober.

Monoplane Model

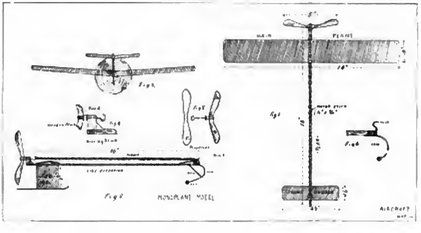
The monoplane model shown here in plan, side elevation and end elevation, can be made by any boy possessing a few tools, a little money and considerable patience. This type costs so little that a large number of experimental machines can be made without dipping deeply into one's pocket; it is therefore a type which will not fail to appeal to those model makers who have to consider the pennies. Turning now to the actual construction of the model, the accompanying diagrams must be carefully followed out.

The fuselage or main frame consists simply of a small spruce stick with the propeller, bearing and hook attached as shown. Several different types of propellers can be used, either of aluminum or wood.

The main plane, rudder and keel, are made of strip wood 1-16 inch thick, cut to the dimensions given, and attached by nailing or wrapping to the main stick.

About 30 feet of 1-16-inch square rubber strands will furnish the necessary power when wound up about 150 turns.

To fly the model, wind up the propeller 150 turns to the right, grasp it by the rear and launch gently forward, releasing the propeller at the same time. Changing the angle of the small front plane will cause the model to rise or fall and constant tinkering is necessary to get the correct adjustment.



BOSTON-HARVARD AVIATION MEETING—General Details of Machines Entered.

MONOPLANES

PILOTS	Make of Flyer	Supporting Surface in Sq. Ft.	Weight Flying Order	Stability	Chassis	ENGINE				PROPELLERS					WINGS		Rudder	Tail	Length
						Motor	H. P.	Cooling	Ignition	Make	Blades	Diam.	R. P. M	Pitch	Spread	Depth			
Horace F. Kearny	Pfitzner	180	430	Sliding Panels	Wheels	Curtiss 4-cyl.	25	Water	Bosch Magneto	Pfitzner	2	6'	1260	4'6"	36'	6	3'x2'	6'x2'	30'
C. Grahame-White	Blériot	140	600	Warping	Wheels	Gnôme 7-cyl.	50	Air	Bosch Magneto	Chauviere	2	7'6"	1200	5'6"	24'	6'	2'x2	6'x3'6"	23'
Gardiner G. Hubbard	Hubbard	224	940	Ailerons	Wheels	Elbridge 2-cycle	40	Water	Bosch Magneto	Requa-Gibson	2	7'	1050	4'	34'	7'	2'6"x2'8"	10 sq. ft.	28'

BIPLANES

PILOTS	Make of Flyer	Supporting Surface in Sq. Ft.	Weight Flying Order	Stability	Chassis	Motor	H. P.	Cooling	Ignition	Make	Blades	Diam.	R. P. M	Pitch	Spread	Depth	Rudder	Tail	Length
Charles F. Willard	Curtiss Special	300	675	Ailerons	Wheels	Curtiss 8-cyl.	50	Water	Bosch Magneto	Curtiss	2	7'	1100	6'	32'	5'	2'8"x3'4"	7'x27"	34'
H. Angus Conners	Conners	450	840	Auto-Stabilizing	Farm'n Type	Conners 8-cyl.	40	Water	Bosch Magneto	Scheveron		8'	1200	7'	33'	5'5"	2'10"x3'10"	7'6"x20"	36'
John G. Stratton	Burgess Co. &Curtis No. 2	310	550	Ailerons	Wheels & Skids	Curtiss 4-cyl.	25	Water	Bosch Magneto	BurgessCo. & Curtis	2	6'6"	1100		27'	4'6"		15 sq. ft.	26'
C. Grahame-White	Farman	429	1100	Ailerons	Wheels & Skids	Gnôme 7-cyl.	50	Air	Bosch Magneto	Chauviere	2	8'6"	1200	4.27'	33'	6'6"	Double 4'x3'	8'x6'6" Biplane	38'
Glenn H. Curtiss	G. H. Curtiss	263	650	Ailerons	Wheels	Curtiss 8-cyl.	60	Water	Bosch Magneto	Curtiss	2	8'	1250	6'6"	26'	4'6"	Horizontal Rudder 6'x2'6" Vertical Rudder 2'4"x3'		28'
Clifford B. Harmon	Farman	429	1100	Ailerons	Wheels & Skids	Gnôme 7-cyl.	50	Air	Bosch Magneto	Chauviere	2	8'6"	1200	4.27'	33'	6'6"	Single 4'x3'	8'x6'6" Biplane	38'
Augustus Post	G. H. Curtiss	236	675	Ailerons	Wheels	Curtiss 4-cyl.	25	Water	Bosch Magneto	Curtiss	2	6'	1250	4'	26'	4'6"	Horizontal Rudder 6'x25" Vertical Rudder 25"x28"		28'
Ralph Johnstone	Wright	485	800	Warping	Wheels & Skids	Wright 4-cyl.	30	Water	Magneto	2 Wright Propellers	2	2 8'6"	450		39'	6'2"	Twin Vertical Rudders		
Walter Brookins	Wright	538	1036	Warping	Skids	B. & M. 4-cyl.	25	Water	H. T. Magneto	2 Wright No. 2	2	2 8'2 4"	450		40'	6'6"	Twin Vertical Rudders		
William M. Hilliard	Burgess Co. & Curtis Model B	286	594	Ailerons	Wheels & Skids	V. 8-cyl.	50	Water	Bosch Magneto	BurgessCo. & Curtis	2	8'	1400	55 7"	28'9"	5'6"		8'x2'6"	33'4"
James V. Martin	Harvard I	230	400	Combination Front Rud'r & Ailerons	Wheels & Skids	Cameron 4-cyl.		Air			4		1200						
John G. Stratton	Burgess Co. & Curtis Model C	320	400	Ailerons & Curtis Deflector	Wheels & Skids	Clement-Bayard 2 cyl.	30	Water	Bosch Magneto	BurgessCo. & Curtis	2	6'6"	1250	44"	32'	4'8"		6'x30"	31'

TRIPLANE

PILOTS	Make of Flyer	Supporting Surface in Sq. Ft.	Weight Flying Order	Stability	Chassis	Motor	H. P.	Cooling	Ignition	Make	Blades	Diam.	R. P. M	Pitch	Spread	Depth	Rudder	Tail	Length
A. V. Roe	Roe	320	660	Ailerons	Farman Type	Green 4-cyl.	35	Water	Bosch Magneto	Roe Tractor	2	8'	1200	6'6"	31'	3'6"	5'x2'6"	Triplane	23'

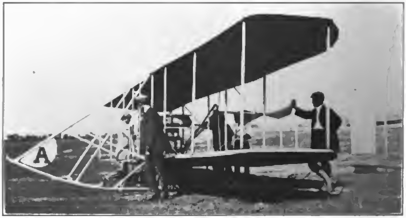
THE BOSTON-HARVARD AVIATION MEET

This Meet took place at Atlantic, near Boston, from September 3rd to 13th inclusive; so successful was it and so large the attendance that it was continued two extra days, (September 14 and 15) during which special prizes were offered. The Boston-Harvard Meet was the second great competitive meet ever held in America, the first being held at Los Angeles, January 10th to 20th, last (AIRCRAFT for March).

A FLIGHT BY WILLARD ON HIS BIG PASSENGER-CARRYING CURTISS.

CLAUDE GRAHAME-WHITE ON THE FARMAN BIPLANE WITH WHICH HE DID ALL OF HIS FLYING, EXCEPT THE SPEED CONTESTS FOR WHICH HE USED A 50 H. P. GNOME-BLERIOT.

GARDNER C. HUBBARD AT THE WHEEL OF HIS MONOPLANE FITTED WITH AN ELBRIDGE 2 CYCLE ENGINE AND A REQUA-GIBSON PROPELLER.



THE NEW "HEADLESS" WRIGHT FLYER.
FROM LEFT TO RIGHT: WALTER BROOKINS, WILBUR WRIGHT AND RALPH JOHNSTONE.

THIS PICTURE SHOWS BUT A PORTION OF THE GRAND STAND ABOUT ONE QUARTER OF A MILE IN LENGTH; AS CAN BE SEEN IT WAS PACKED WITH SPECTATORS. THE JUDGES' STAND CAN BE SEEN IN FRONT OF THE LEFT CENTRE OF THE STAND, WHILE AT THE EXTREME RIGHT END WAS LOCATED THE SIGNAL BOARD BY WHICH ALL MACHINES BEGAN THEIR FLIGHTS.

ONE OF THE BIG TENTS USED AS A SHELTER FOR THE AEROPLANES READING FROM LEFT TO RIGHT ARE THE CURTISS, BURGESS, ROE, FARMAN AND BLERIOT MACHINES.

JOHN BARRY RYAN AND CLIFFORD B. HARMON EXCHANGING JESTS BETWEEN FLIGHTS. HARMON WON EVERY AMATEUR PRIZE OFFERED AT THE MEET. MR. RYAN AND MR. HARMON ARE THE ORIGINATORS AND PRIME MOVERS TOWARD THE ORGANIZATION OF AN AERONAUTICAL RESERVE FOR THE UNITED STATES ARMY

Official Results of the Meet

POINTS

	Speed.	Alt.	Dur.	Dist.	Bombs	Total
Grahame-White,	15	12	11	8½	180	226.5
Brookins	—	15	2	1	93	111
J'nstone	—	2	13	13	24	52
Curtiss..	11	—	—	½	27	38.5
Willard.	8	—	—	—	13	21

BEST PERFORMANCES

DURATION: Johnstone (Wright) 3 hrs. 5m. 40s. (American Record)

DISTANCE: Johnstone (Wright) 101 miles, 389 feet. (American Record)

HEIGHT: Brookins (Wright) 4,732 feet

SPEED: Grahame-White (Bleriot) 5¼ miles in 6m. 1s.

SLOW-FLYING: Brookins (Wright) 5¼ miles in 13 m. 48 s.

LANDING—ON SKIDS: Johnstone (Wright) 5 ft. 4 in. from given point. (World's Record.)

LANDING—ON WHEELS: Grahame-White (Farman) 33 ft. 4 in. from given point.

RISING: Grahame-White, 26 feet 11 in. from standing start.

BOMB-THROWING: Grahame-White (Farman.)

BOSTON LIGHT PRIZE: (Twice to light and return, say 33 miles) Grahame-White (Blériot,) 34m. 11s.

SAMUEL F. PERKINS, THE FAMOUS AMERICAN "KITE KING," SUSPENDED 300 FEET HIGH AND SUSTAINED BY NINE GREAT 12 FOOT AEROPLANE KITES, THE TOPMOST OF WHICH IS OVER A MILE UP. MR. PERKINS CLAIMS THESE TO BE THE ONLY MAN-LIFTING KITES IN AMERICA; HE INTENDS TO ADAPT KITES TO THE USE OF WIRELESS TELEGRAPHY IN WAR

THE A. V. ROE TRIPLANE WAS DAMAGED IN LANDING AFTER MAKING A SHORT FLIGHT.

AN ORIGINAL BIPLANE: THE VENDÔME

FOREIGN NEWS

Australia

An interesting machine, somewhat on the lines of the Curtiss, has been undergoing trials at Mia-Mia; it is constructed by Mr. Duigan, of that town. Short hops have already been made in it, and the inventor hopes to accomplish longer flights as soon as it is fitted with a new propeller.

This is (as far as can be ascertained) the first machine built entirely in Australia, which has succeeded in leaving the ground.

Austria

On August 18, Warchalowski, using a Vindobona biplane, flew across Vienna at a height of 700 metres. He covered a distance of 90 kilometres, flying from Vienna-Neustadt to Stefansturm and return.

Belgium

Another martyr to the cause of aviation is Nicholas Kinet. On August 3, while flying at the Brussels Meet, his machine was caught in a squall. Something broke and the biplane fell, crushing its driver.

Mlle. Hélène Dutrieu, the young French aviatress, flew with a passenger from Ostend to Bruges and back on September 2.

At Bruges Mlle. Dutrieu circled the famous belfry at a height of 1,300 feet, with the chimes ringing in honor of the feat. This is by far the most wonderful flight accomplished by a woman

Canada

A Flying Meet is to be held at Winnipeg during the last week in September. As this is just previous to the International meeting in New York, it is hoped that some of the flyers entered there will visit the Canadian city first.

England

Starting from his hangar at Cardiff at 8 P. M. recently, Mr. E. T. Willows successfully navigated his dirigible "Willows II" to London, landing on the Winn estate at Lee. He passed over the Crystal Palace, where he intended to land, but his grapple failed to hold, and, having run out of petrol, he was obliged to travel some four miles further before finding a suitable landing place.

A Curtiss type machine has been built in Liverpool by M. C. C. Paterson. This machine is particularly interesting because it is the first time a Curtiss type has been successfully flown with an Anzani motor. The best flight so far was one of 8 miles, across country.

Perhaps the most successful meeting so far held in Great Britain was that which took place at Lanark, Scotland, from August 6 to 13. The aviators who took part were: Armstrong Drexel, Marcel Hanriot, A. Audemars, Tétard, Champel, Cattaneo, S. F. Cody, G. Barnes, A. Ogilvie, L. Chavéz, Graham Gilmour, L. Blondeau, H. J. Harding, James Radley, Cecil Grace, H. Kuller and Captain Dickson. The results of the meet were:

Fastest Mile—Monoplane: Radley; Biplane: Grace.

Fastest Kilometre—Monoplane: Radley; Biplane: Grace.

Greatest Altitude—Drexel, 6,750 feet, world's record; Chavéz, 5,250 feet.

Speed for Five Laps—Radley, 58.32 miles per hour; Cattaneo, 56.27 miles per hour.

Slowest Lap—Dickson, 21.29 miles per hour; Ogilvie, 21.4 miles per hour; Cockburn, 26.32 miles per hour.

Fastest Lap—Radley, 58.32 miles per hour.

Fastest Cross-Country Flight—Monoplane: MacArdle, 23 minutes 4 1-5 seconds; Biplane: Grace, 32 minutes 21 2-5 seconds.

Aggregate Cross-Country—Dickson, three trips

Longest Single Flight—Cattaneo, 141 miles 188 yards (British Record) in 3 hours, 18 minutes 9 1-5 seconds.

Aggregate Distance—Cattaneo, 399 1-4 miles; Drexel, 317 1-2 miles; Grace, 102 1-2 miles.

Starting Prize—Radley, 57 feet; MacArdle, 59 feet; Gilmour, 101 feet; Dickson, 102 feet.

Delivery of Dispatches—Grace, 23 feet 10 inches.

Weight Lifting—Grace, 353 1-2 pounds.

Two remarkable flights were made from Blackpool on August 10. The first was by Mr. Robert Loraine. He arrived at the Blackpool aerodrome at 6 o'clock on Tuesday morning, and found the weather conditions almost ideal for flying. He therefore determined to try a cross-country flight. The Gnôme was soon started, and at 6.26 A. M. Mr. Loraine was in the air; climbing to a good altitude, he eventually darted off in the direction of Southport, and, crossing the town, turned out to sea, direct across to the Welsh coast, striking it at Rhos and landing on the golf links there after a flight of about 60 miles. The time taken was a little over an hour and a half.

About 11 o'clock on the same day, Mr. Grahame-White started up his Farman machine and paid a visit to the Fleetwood Barracks, 10 miles away. From there he re-ascended and flew to Barrow, across Morecambe Bay. He landed just by the shed for the big naval dirigible, and, after a ten minute rest, started off on the return journey to Blackpool, where he landed safely on the aerodrome at a quarter to one. He was flying at a good height, varying between 1,000 and 1,500 feet.

France

The final results of the Caen meeting give the Prix de Caen for totalization of time in the air to young Marcel Hanriot, with a total of 9 hours 57 minutes 56 1-5 seconds, using a Hanriot monoplane fitted with a Clerget engine.

The second man was Martinet on a Farman, with 6 hours 49 minutes 10 2-5 seconds. The third, Paillette on a Sommer, 6 hours 38 minutes 22 seconds; fourth, De Chauveau (Antoinette), 3 hours 41 minutes; fifth, Crochon (Sommer), 2 hours 43 minutes 25 2-5 seconds; sixth, Renaux (M. Farman), 2 hours 38 minutes. The speed prizes went to Morane (Blériot), 4 minutes 38 seconds; second, Aubrun (Blériot), 4 minutes 52 seconds; third, Renaux (M. Farman), 5 minutes 59 seconds; fourth, Martinet (H. Farman), 6 minutes 33 seconds. The height prize was won by Morane with 1,250 metres; the cross-country flight by Morane, who did 13 minutes 56 seconds for the 21 kilometres. The prize money was divided as follows: Morane, 16,000 francs; Hanriot, 13,000 francs; Martinet, 6,500 francs; Aubrun, 5,000 francs; Paillette, 3,500 francs; Renaux, 2,000 francs; De Chauveau, 1,500 francs; Crochon, 1,000 francs.

The first of August was notable for two very fine passenger flights. At Mourmelon Henry Farman took up with him three passengers, M. Vuillaume, Roth, and Lepoix; the three passengers, pilot, oil, and petrol weighed 235 kilos. The flight lasted 1 hour 4 minutes, from 5.48 P. M. to 6.52 P. M. This performance, however, was beaten on the same day by de Baeder at Douai, who, on a Breguet biplane, succeeded in flying with three passengers, weighing 322 kilos, including oil and petrol. The weight was made up of 20 kilos of petrol, 13 kilos of oil, de Baeder himself 69 kilos, Castro 79 kilos, Biancou 74 kilos, Cuilbert 66 kilos. This flight was only a short one, however.

AUBRUN CARRIED IN TRIUMPH AT THE FINISH OF THE CIRCUIT DE L'EST, IN WHICH HE FINISHED SECOND.

The Gnôme Company are experimenting with a new type of engine, which is of the same dimensions as the 50-h. p., but fitted with mechanically operated valves. It is claimed to give considerably more horsepower for the same weight with less gasoline consumption.

On August 4 Mr. Henry Farman was out trying his new monoplane, and some good flights were accomplished. It is to be hoped that one of these machines will be entered in some of the coming meets.

Ladougne, a picture of whose machine appeared in the September number of AIRCRAFT, page 253, continues to make good progress on his Goupy biplane. On August 8, he flew for over an hour with a passenger.

Another successful biplane is that constructed by M. Savary. This interesting machine somewhat resembles the new headless Wright machines, but has the two chain-driven propellers located in front. It made a flight of 40 minutes on August 7, with Picard at the helm.

It is reported that Blériot is building an "Aerial 'Bus" which will be capable of accommodating four passengers.

On August 14, Poillot, the new Savary pilot, made a magnificent flight of 30 minutes, at a height of 200 metres, over the country around Chartres. A remarkable thing in connection with this flight was the magnificent glide he made from this height when his motor stopped. He had only got his pilot's license on August 11.

With the object of rendering aviation more safe, the Ligue Nationale Aérienne will organise three competitions. One will be for protective clothing for aviators, the second will be for appliances for reducing the shock of sudden landings, and the third for a system of parachutes or spreading surfaces, which should open out and retard the speed of an aeroplane's fall.

It is reported that Princess Dalgorowki is learning to fly a Blériot and has already made several short flights.

Although it was at first feared that the injuries sustained by de Baeder as the result of his accident on the opening day of the meeting at Cambrai on August 20 would prove fatal, later reports are reassuring. After mastering the Voisin biplane, de Baeder took up the Farman, while recently he had been using a Bréguet biplane, with which he had made many successful flights. For some time he had been at Douai, and wanted to fly from there to Cambrai. The elements, however, rendered this out of the question, and on his arrival at the aerodrome, de Baeder found the weather conditions all against flying. He nevertheless promised to go up at six o'clock, and although the wind was then very strong, he started off. The machine swayed a good deal, and it had just got past the crowd when it dived suddenly to the ground. The machine was badly broken, but de Baeder remained in his seat. He was rendered unconscious, and subsequent examination showed that one of his wrists and one of his ankles were broken, and his skull fractured. At first the doctors gave little hope of recovery, and the injured man did not regain consciousness until the following day. It is now reported, however, that he is out of danger.

On August 29, Morane in a Blériot monoplane, rose to a height of 7,054 feet at Havre, according to official figures. He has since then bettered this record, for on September 3 he rose to the remarkable height of 8,741 feet: both of these were world's records.

M. Bielovucel, after accomplishing his wonderful flight from Paris to Bordeaux, announced his intention of continuing his aeroplane journey to Milan, Italy.

On September 1, the American aviator, Weyman, flew in a biplane from Mourmelon to Paris, a distance of 105 miles, carrying a passenger.

He landed at Montmirail, 40 miles from the start, for luncheon, and, on again ascending, went to Massy, 55 miles from Montmirail, where he stopped to replenish his gasoline.

As soon as possible Mr. Weyman will start for the special Michelin prize of $20,000 for a flight from Paris to Clermont-Ferrand, a distance of 217 miles, as the crow flies.

A little over a year ago there were less than 100 aeroplanes in Europe, most of these being in France. Recently Blériot has built 250 monoplanes like the one in which he crossed the English Channel, and Farman has manufactured more than 100 biplanes. Other types bring the French production up to about 800, which have sold for something over $2,500,000. Factories are working to their full capacity.

The small Blériot sold at first for $2,000, but the latest types now cost from $3,000 to $5,000. The catalogue price of other important makes are: for the Farman, $5,600; for the Voisin, $4,600; for the Antoinette, $5,000; for the Wright, $5,000, and for the Sommer machine, $5,000.

On August 29 Louis Bréguet took up five passengers in his biplane at Lille. The total weight sustained by his machine was 921 pounds.

ALFRED LEBLANC AND THE GNÔME-DRIVEN BLERIOT WITH WHICH HE QUALIFIED FOR THE FRENCH GORDON-BENNETT TEAM AND WON THE CIRCUIT DE L'EST.

Germany

The following list of the Parseval airships in action and in course of construction affords interesting reading: P. L. I. 3200 cubic metre-capacity, 85-h. p., owned by the Imperial Aero Club; P. L. II, 4000 cubic metres, 85-h. p., owned by the German War Office as P. I; P. L. III, 6600 c. m., 200-h. p., owned by the German War Office as P. II; P. L. IV, 2300 c. m., 50-h. p., Austrian War Office; P. L. V., 25-h. p., 1200 c. m., owned by the Aerial Navigation Company as Sport-Airship No 1; P. L. VI, 220-h. p., 6800 c. m., destined for the Munich Parseval Aerial Navigation Co.; P. L. VII, 220-h. p., 6700 c. m., destined for Russian Government; P. L. VIII, 300-h. p., 5600 c. m., destined for Brussels; P. L. IX and X, both of 70-h. p. and 1350 c. m., will be known in future as Sport Airship 2 and 3; P. L. XI, 320-h. p., 5600 c. m., destined for the Prussian War Office

The two aviation days at Mulhouse in Alsace were greatly interfered with by the inclement weather. Thelen on a Wright machine won the duration prize for the longest flight total, Jeannin running him close with his Farman. Other competitors were Gorrissen, Behrend and Amerigo.

Count Zeppelin and his party will have arrived at Spitzbergen long before these lines appear; among the participants in the preliminary Arctic Airship Expedition is H. R. H. Prince Henry, of Prussia, who will remain there until the party returns to Germany this month. The expedition proper with its two airships takes place in the year 1912.

The second of the two national meetings scheduled this year for Berlin-Johannisthal took place between the 7th and 13th of August. This meet had a sum of 50,000 marks guaranteed for prize money, 18,000 marks having been presented by the German War Office to encourage aviation in the Fatherland.

Italy

On August 8 the official opening ceremony of the new flying school at Pardenone, near Milan, took place, when about 30,000 persons assembled to witness a series of exhibition flights by Cheuret, on a Henry Farman biplane and Ehrmann on a Blériot monoplane. In the evening a banquet, at which the Government was represented, was given by the municipal authorities.

On August 20, the Italian Army officer, Lieutenant Vivaldi Pasque, was killed in a flight near Centocelle, due to the sudden stoppage of the engine.

Japan

It is reported from Berlin that the Japanese Government has ordered twenty-seven Wright aeroplanes from the German builders. They are to be delivered as soon as possible, and meantime Captain Engelhardt is to instruct a similar number of Japanese officers in the manipulation of the machine. Seven officers commenced their tuition on August 5.

Switzerland

During the month that the airship "Ville de Lucerne" has been in commission she has regularly made daily trips, except of course, when the weather has been bad. On several days more than one trip has been made—as, for instance, on the 8th inst., when five excursions were made, the total number of persons carried during the day being 48. In 15 days 21 ascents were made and there was no difficulty in obtaining the full complement of passengers at $30 per head.

On the 14th inst., four trips were made in various directions over the different lakes, and also over the city of Berne.

THE AERONAUTIC SOCIETY'S NEW SHEDS AT GARDEN CITY

CLUB NEWS

By Ada Gibson

Aero Club of Pennsylvania

The big Aero Show which had been announced by the Aero Club of Pennsylvania to be held in the First Regiment Armory, Philadelphia, October 22nd to November 5th, has been postponed a few days and will now be held November 2nd to 12th.

This postponement has been found necessary because a number of the aeroplanes which will be on exhibition and which will be the principal attractions for the public, will be competitors in the International Races at Belmont Park, and as these races have been put off until October 22nd to 29th, arrangements have been made to open the show on the Wednesday following, thus giving plenty of time to ship the machines from Long Island to Philadelphia and to set them up in the armory.

In response to a number of requests from exhibitors who are also going to show their goods in St. Louis, the Aero Club of Pennsylvania is arranging to have a special car engaged to be packed with goods from the Philadelphia show immediately on the close, November 12th, and to send this car by express to St. Louis so that the exhibits can be set up there in time for the opening.

A FAMOUS AMATEUR'S REWARD

The Philadelphia show is attracting unusual interest among dealers in aeronautic and aviation supplies because of the great activity that has recently been shown by the Aero Club of Pennsylvania. This organization has gone into ballooning on a very wide scale and is having more frequent ascensions than any other club in the country. Its new grounds for aeroplane flights at Clementon, N. J., have been pronounced by those who have seen them to be far ahead of most other grounds both in their natural advantages and in the buildings which have been put up on them.

The hangars on these grounds are the very last word in housing for aerial vehicles, being three hundred feet long and so constructed that there are six separate compartments each fifty feet wide and forty feet deep, each containing work bench and two sleeping compartments to accommodate four persons. The club is also installing a complete machine shop to be run by a five H. P. gas engine, and the fact that every one of these "stalls" has already been leased for the entire winter is an indication of the busy days that are in store for members of this organization.

A large percentage of the space in the Aero Show has already been taken by residents of Eastern Pennsylvania, Southern New Jersey and Delaware, of which Philadelphia is the natural centre, these residents having turned, in remarkable numbers, to the manufacture and sale of aeronautic and aviation goods. The recent growth of the Aero Club of Pennsylvania has been one of the most notable features of American aviation news, and the club is being run upon a business basis which promises well for its future. The show which it is now preparing is called THE THREE STATES AERO SHOW because of the natural situation of Philadelphia as the centre of its territory and the claim of the Aero Club of Pennsylvania that it is the controlling body in that territory seems amply borne out by the fact that all aviation events which have been held during the past month within a radius of seventy-five miles of the city have been first referred to this club for approval and in many cases have been held under the auspices of the organization.

THE THREE STATES AERO SHOW has been placed by the club entirely under the management of Henry M. Neely, the Secretary, who is also Chairman of the Committee on Contests and Exhibitions, and who has had many years' experience in show management and publicity.

Southern California News

By M. Fer-Don

A novel feat in ballooning was accomplished at Los Angeles when the captive balloon "City of Los Angeles" ascended with a Flanders automobile attached to the suspension ropes in lieu of the usual basket.

Stevens brothers and Lunt also have a captive bag here with which two prominent society women made the ascension clinging to ropes with basket removed.

The envelope of Burns and Grant had been lately varnished and the bag was inflated. Roy Field, engineer, climbed between net and envelope to remove wrinkle at the top. His foot punctured the bag and the out pour of gas made Field lapse into unconsciousness and release his hold—making a record of falling through a balloon.

A trip was made in a 75,000 cubic ft. spherical bag to San Bernardino, a distance of 78 miles, in 3 hours 15 minutes. This is the best time made with an balloon in California.

Mrs. Gordon, of Los Angeles, is the oldest woman to have made an ascension. She is 85 years of age.

The Aero Club of California have a dozen machines in their hangars. Some of these are complete, while others are finished excepting that motors have not yet been installed.

Knabenshue is offering a cup to the first member of the club to make a flight of 500 feet. F. J. Slavin attempted a flight for the cup on August 6th. In the morning he succeeded in clearing the ground for about 125 feet; in the afternoon he made five attempts, breaking two propellers, but the sixth time he rose to a height of 30 ft., with the machine running smoothly for 75 feet; it then crashed to the ground, completely wrecking the running gear. Slavin, however, escaped injury.

The accident was due to a slight mechanical defect in the control of the fore-and-aft stability; the control running to the elevator broke, thus leaving the elevator free.

Slavin's patent attorney, Mr. Blakeslee, and his backer, Harvey Bissel, son of the millionaire carpet-sweeper manufacturer, believe they have solved the problem of automatic lateral stability. The planes are of the type of rocking wings.

Professor H. LaV. Twining, president of the club, to-day got a forward movement out of his famous ornithopter. He has enlarged the wings of his bird machine and now can make a speed of four miles per hour.

Scholanni, a Hungarian, has constructed a new monoplane which is fitted with an Anzani engine. This machine has a perpendicular rudder in front.

Charles Skoogland has a very nicely constructed monoplane. The planes are sparred with laminated ribs and covered with canvas laced to the spars. The main feature of this machine, however, is the ailerons, which consist of canvas on a roller and used in the same way as a window shade. These are placed on the front of his planes.

Asbury Park Meet

Just as the September number of AIRCRAFT was on the press, the Asbury Park Aero Meet was held at Interlaken, N. J., between the days of August 10 and 20. The meet was prolonged, however, for another week, making it last until August 27.

While no records were broken at this meet, still some splendid flying was done by Brookins, Coffyn, Johnstone, Hoxsey and La Chapelle with biplanes, while Fred L. Owen made daily flights with his dirigible.

Aeronaut Johnny Mack's force of parachute jumpers also gave daily exhibitions in this line of work. The meet was held under the auspices of the Aero and Motor Club of Asbury Park and was a success in almost every particular.

Among the officers who deserve particular mention for the splendid way the meet was handled are Colonel Mahlon R. Margerum, the director general, and Louis P. Randall, his assistant.

FOR A GREAT PERFORMANCE

Harold E. Denegar, the secretary of the meet, also deserves much credit for the able manner in which he attended to the handling of the press representatives.

Entrants for the Gordon Bennett Elimination Balloon Race to be held at Indianapolis, Indiana, September 17th, 1910, are:

Alan R. Hawley, H. E. Honeywell, Louis Von Phul, Charles Walsh, Clifford B. Harmon, G. L. Bumbaugh, Carl G. Fisher, William T. Assmann, J. H. Wade, Jr., Arthur T. Atherholt.

The following dates are announced by the Wright Company of their exhibition series until November 1st:

Detroit, Mich., Sept. 19-24.
Knoxville, Tenn., Sept. 22-28.
Trenton, N. J., Sept. 26-30.
Rochester, N. H., Sept. 27-30.
Springfield, Ill., Oct. 1-7.
Sedalia, Mo., Oct. 1-7.
Richmond, Va., Oct. 3-8.
Washington, Pa., Oct. 3-7.
Birmingham, Ala., Oct. 6-12.
St. Louis, Mo., Oct. 8-18.
Macon, Ga., Oct. 28-Nov. 1.

BETTER AEROPLANE ENGINES

By Claude Grahame-White

From the "Daily Mail," London

Speed is the aviator's demand. In speed he sees a solution of his greatest problems. Gradually it has dawned upon him that the air is the ideal element for high-speed traffic—that through the air, before very long, speeds will be attained which are impossible with vehicles on land or ships on the sea. To the makers of engines the aviator says: "Give me more power, which spells speed." To the builders of aeroplanes he cries: "Construct me planes capable of the maximum of speed."

And the speed of aeroplanes has been creeping up. At first it was thirty-five miles an hour. Then came forty. Soon this was left behind. Round prepared aerodromes a pace of forty-five and fifty miles an hour was attained. Nor did the seeking of speed end here. With racing monoplanes a rate of fifty-five and sixty miles an hour became possible. Not satisfied with this, pilots have added mile by mile, until the latest records stand at sixty-six miles an hour.

Personally, I believe that this is only the beginning of the speeds that aeroplanes will be able to attain. Someone was discussing this vitally interesting aspect of aviation with me only the other day. He asked the question: "What rate will aeroplanes be flying through the air in a comparatively short space of time?" My answer was: "In six months I fully expect that a monoplane will be registering speeds of 100 miles an hour." Friends of mine who are experts upon the scientific aspects of aviation predict that eventually speeds of 200 and even 300 miles an hour will be possible. At this one's imagination is apt to reel. But this much is certain: If the flying machine is to become of real importance, and not remain always a sporting toy, it will need to be speedier than any method of transit on land.

The aeroplane engine is the crux of the situation. Upon its development—rapid or slow—depends also the development of aviation. Fortunately for the new science in which we are all so interested, the flying-machine motor is already making quite extraordinary strides. As a well-known maker remarked to me the other day: "Each motor which we turn out nowadays marks a step up the ladder of progress." And the engines for air craft are not only being made more reliable, but they also weigh less than they did at first for each horsepower of energy produced.

This is all-important. In this respect alone engineers have been achieving results of late which would have been declared absolutely impossible by experts a few years ago. From my point of view, as a pilot of aeroplanes, the improvement in engines has been astonishing. Last year, although long flights were occasionally made, the undertaking of a cross-country journey was a matter of considerable uncertainty. Now, however, although our engines are still admittedly imperfect, one can fly from point to point with a growing confidence—and an increasing absence of risk.

Although much of the future of aviation is still in doubt, the establishment of regular "air-stations" in the vicinity of large towns is an innovation which will soon be an accomplished fact. I am, in fact, preparing one now myself at Park Royal—the point from which I started upon my first London-Manchester flight. The idea of the "air-station" is simple. It will, roughly, correspond to the garage for the motor-car. There will be a large, smooth open space for machines to start from and also to alight upon. There will be a number of sheds in which air-craft will be housed. There will be repair shops; also depôts in which oil and gasoline will be stored. The aviator, studying a special map before he starts upon a long cross-country flight, will locate the position of the various "air-stations" en route and halt at some of them—filling up his tanks, having his engine overhauled, and perhaps garaging his machine for the night in one of the sheds provided.

While speaking of the utility of the "air-stations," I should mention my belief that what is wanted to develop the practical phases of aviation is more cross-country flying. Making circuits round and round an aerodrome is really very little use. But, in this connection, I certainly hold the view most strongly that spectacular and demonstration flying—although it is often condemned by those who regard aviation from the purely scientific point of view—represents a really useful phase. Before anything was done in England it became absolutely vital to interest the public. How has that been done? By organizing great contests—such as The Daily Mail's £10,000 prizes—and also by arranging flying meetings and individual displays by aviators. By these devices the public mind, which was apathetic before, has been thoroughly interested in the significance of aviation. When it is considered that sufficient publicity has been given to the possibilities of flying, then will come the time to cease displays and devote one's energies solely to the development of the industry.

When I have been discussing this point some people have said to me: "Ah! but these displays lead to accidents." My reply has been: "In such a new and untried science as flying, accidents are inevitable. We can only learn by our experiences while actually in the air. And, above all, remember this—every accident, however small, teaches an absolutely invaluable lesson. Every disaster I look back upon in the brief history of aviation has taught such a lesson that a similar catastrophe is never likely to occur again."

Already—a convincing proof of the development of flight—international authorities are discussing seriously the immediate lying down of regular "airways." Simply described, an "airway" will direct the passage of air-craft over a given tract of land when in flight from city to city or from one country to another. These "airways"—several have already been provisionally mapped out in England—will make it incumbent upon pilots to fly their craft over sparsely populated tracts of country whenever possible, and will also obviate flying over towns.

We do not want to hamper aviation with too many rules, but danger to the people on the earth must be obviated, and the risk of involuntary descents in crowded districts must be avoided. The rights of private property must be considered also; it is clear that machines cannot be allowed to descend haphazard just where they like. Hence the need both for "airways" and "air-stations."

So far, the whole attitude towards flying has been to encourage it—a striking contrast to the condemnation of the railway train when it was introduced. This toleration the aviator must do nothing to undermine. Motoring would not have been discredited in many people's eyes had it not been for the "road-hog." We must have no "air-hogs." As aeroplane owners increase many perplexing problems will arise. What is wanted is a sensible code of rules, framed in the public interest by practical authorities and tactfully enforced before there is possibility of any outcry against the new sport.

For rapid transit generally; for fast mail traffic; for express passenger services; for naval and military reconnoitring work; as instruments of destruction—although this phase may be far distant—these are some of the possibilities of the aeroplane. What we now want is a machine which will fly reliably in any wind short of a gale.

RECORDS AND STATISTICS

By G. F. Campbell Wood

Height Records

Aviation records for time and distance have been improved upon with bewildering rapidity in the past few months; their betterment, however, seems actually tame and slow compared with that of the record for height

The history of this record properly begins, of course, with the first fledgling-like hops made a few inches or feet above the ground by Clément Ader in the "nineties" of last century and with the first flights of the Wright brothers in 1903, 1904 and 1905. In 1906, Santos-Dumont, Ellehammer and Vuia got off the ground for a few seconds but nothing like as high as the Wrights. In the next year an "altitude" of thirty feet was still considered a dizzy height, but towards its close this was exceeded by several aviators, notably by Esnault-Pelterie, who, being carried up seventy feet against his will, and unable to check the rise, shut off the engine, escaping unharmed from the hard landing. This was long quoted as the greatest height reached by an aviator.

It was only in 1908 that aeroplanes really got away from the immediate neighborhood of the earth—the bottom of the actual ocean—with its treacherous eddies and currents.

In May, 1908, several sportsmen in Paris started a subscription list for a height-prize, the money—2,500 francs—to go to the first aviator to pass over a captive balloon 25 metres (82 feet) above the ground; this initiative raised quite an outcry at the time, it being claimed that the aviators were being encouraged to needless recklessness; the money was raised nevertheless and the prize founded. It was ultimately won by both Wilbur Wright and Henry Farman, at the Camp d'Auvours near Le Mans and at the Camp de Chalons, respectively; they had both, however, flown at a greater height, on previous unofficial trials.

Wright then won a prize for flying at 30 metres (98 feet) whereupon another was immediately offered to the aviator exceeding 100 metres (328 feet); Wright startled the world by almost immediately accomplishing this feat—this was on December 18, 1908, when in a flight which closely followed that on which he had broken the world's records for distance and time, he rose to 360 feet.

Notwithstanding the enthusiastic belief in the progress of flying, it was earnestly questioned whether this would be surpassed in 1909, and as a matter of fact it stood for seven months; at this time (fourteen months ago) Louis Paulhan had just learnt to drive an aeroplane—a Voisin—and was competing in the first real aeroplane meeting, that of Douai. It was on July 18, that he filled his countrymen with pride by taking his biplane up 120 metres (394 feet), thus being the first to rob the Wrights of one of their world's records.

A few days later came the first cross-Channel attempt of Latham and, when it was noticed at what great height he flew above the sea (it is said at one time to have been in the neighborhood of 1,000 feet), it began to be understood that flying in the upper reaches would not be confined to the foolhardy but might be purposely selected for safer travel.

A keen struggle between Paulhan and Latham was expected at the great Rheims meet for the height prize; unfortunately Paulhan's Voisin was in a smash-up two days before and could not do itself justice; the prize went to Latham with 155 metres (508 feet), which became the official world's record, although the actual altitude reached by him was about twice this height.

Henri Rougier, known only up to that time as a great automobile race-driver, then entered the field and flew on his Voisin at 190 metres (623 feet); this was at Brescia, Italy; then Orville Wright gave the aeronautic world a thrill by climbing to 1,600 feet in an unofficial flight, near Berlin. This height was approached or equalled by the Comte de Lambert, when he flew over Paris, passing several hundred feet above the flagstaff of the Eiffel Tower; officially he was only allowed 300 metres (984 feet): the height of the tower.

On November 5th, at the Brooklands motor-track, England, Paulhan reached 977 feet; he then returned to France and renewed over the Chalons Plains his struggle for the record, with Hubert Latham. Several flights reaching between 1,300 and 2,000 feet in altitude were made by both the famous flyers but the difficulty of measuring the heights reached, and the lack of officials to do so made it very uncertain which had gone the highest Latham gained an official record of 453 metres (1,486 feet) on December 1, and this remained until January 7, when, notwithstanding the cold, he carried it to 1,000 metres, being the first to fly a kilometre above the ground.

Notwithstanding this magnificent effort the record only remained his five days longer, for on January 12, many thousands of miles from Chalons—at Los Angeles—his countryman and rival, Louis Paulhan, climbed into the California sky for forty-four minutes, on his Farman, reaching 4,600 feet according to his barometer and 4,165 feet according to the measurements made from below—the latter figures being declared official.

The record remained Paulhan's throughout the Spring and was not broken until Brookins made his great flights of June and July at Indianapolis, Montreal and Atlantic City, reaching 6,175 feet at the last named place, in a flight which lasted an hour and which still constitutes an altitude record for biplanes

At the recent Rheims meet Latham was up 4,540 feet, beating the French record; this is the greatest altitude at which an Antoinette has flown. Then came the Bournemouth meet where great flights were made by Morane and by Drexel, on their Gnôme-driven Blériots, all British records for height being broken; after this several Blériot pilots seemed to make a concerted attack on the dizzy record; the Belgians, Tyck and Olieslaegers, in their own country, the Parisian-Peruvian Chavèz, and the Italian Cattaneo, at Blackpool, in England, the American Drexel, at Lanark, in Scotland, climbed one and all skyward on their wonderful little monoplanes driven by the no less wonderful little whirling engines.

Below is a list of those who have flown a thousand metres above ground; it will show the result of this onslaught: Cattaneo missed the "vertical kilometre" by a few yards, but the others not only achieved this but the "vertical mile" also.

The first to pass the 2,000 metre mark was Drexel; this was at Lanark on August 11. He was lost in the clouds and only rejoined his friends several hours later; the height reached was at first given as 6,750 feet, but later as 6,600 and this was not beaten until August 29, in an extraordinary flight by Morane, made between two showers, at Havre, and of which the writer was one of the fortunate witnesses. Here again there seemed to be some uncertainty as to the exact figures—6,888 feet, 6,691 feet, and finally 7,052 being given out.

And now this great record has been made most insignificant by the stupendous performances of this same Morane at Deauville on September 3, and of Chavéz at Issy on September 8th.

The height reached by Chavéz was 8,692 feet. Eight thousand six hundred and ninety-two feet! The figures are well worth dwelling on for a moment, if only to bring one's self to realize just what they represent. Compared with the heights of the greatest mountains and the alti-al·tudes reached in spherical balloons, they do not strike one as so marvellous, but what should be borne in mind is that Morane flew nearly nine times as high as the highest building in the world—the Eiffel Tower—more than twelve times higher than the Metropolitan Life Building in New York, three thousand six hundred feet higher than the official record for dirigible balloons and at then height at which very few *real* birds are known to fly in these latitudes.

AVIATORS WHO HAVE RISEN A KILOMETRE INTO THE AIR

AVIATOR	NATIONALITY	PLACE	AEROPLANE	ALTITUDE
Chavèz	Peruvian	Issy	Blériot	2,650 Metres
Morane	French	Deauville	Blériot	2,580 "
Drexel	American	Lanark	Blériot	2,020 "
Brookins	American	Atlantic City	Wright	1,882 "
Tyck	Belgian	Brussels	Blériot	1,720 "
Olieslaegers	Belgian	Brussels	Blériot	1,524 "
Latham	French	Rheims	Antoinette	1,384 "
Paulhan	French	Los Angeles	H. Farman	1,269 "
Weyman	American	Mourmelon	H. Farman	1,250 "
Wynmalen	French	Mourmelon	H. Farman	1,100 "

N. B.—These altitudes are the heights above the ground, not above sea-level; to get the latter, the altitude of the aerodrome should be added; in the case of Lanark this was 700 feet (213 metres.) Atlantic City and Deauville are, of course, practically at sea-level. A metre is 3.28 feet.

NEWS IN GENERAL

Mrs. J. Herbert Sinclair

F. J. SLAVIN'S BIPLANE, LOS ANGELES, CAL.

At Mineola

On August 20, Clifford B. Harmon crossed Long Island Sound in his Farman biplane, covering the twenty-four miles, between the aviation field at Mineola, and Greenwich, Conn., in thirty minutes. For this flight, Mr. Harmon received a cup valued at $2,000 given by Doubleday, Page & Co.

Good flights were made at the Mineola grounds during the last month by Harmon, Hamilton, Baldwin, Seymour, Frisbie, Schreiber and Didier Masson.

Charles K. Hamilton furnished excitement for the crowd by his wonderful series of trial flights in the new machines of J. J. Frisbie and Howard Dietz.

Joe Seymour has fitted 3 ft. extensions to the upper plane of his 25 h.p. Curtiss flyer and they have made a remarkable difference in his flying. He is now able to make six laps of the field and flies much higher and steadier than before.

The biplane constructed by "Slim" Schreiber, Curtiss' former mechanic, for Howard Dietz, has been very successful in its first trials. C. K. Hamilton accomplished a 15-minute cross-country flight with it while the paint was still wet, and both Schreiber and Dietz have flown it since then. The machine is a large biplane of the Curtiss type, having the ailerons pivoted on the rear uprights. It is fitted with a 6-cylinder Kirkham automobile motor of 40 h.p.

Another new machine, which has been flown successfully is that constructed by J. J. Frisbie from parts supplied by C. & A. Witteman. The machine is an exact duplicate of the Curtiss "Hudson Flyer" and is fitted with a 40-60 h.p. Elbridge engine.

On August 5 a new biplane, built by Pincus Brauner, was tried out by Didier Masson, Paulhan's former chief mechanic; he was successful in getting it off the ground at his first attempt.

Harry Harkness' Antoinette monoplane, with Mr. Harkness up, has been out in the early mornings for practice spins and short flights have been accomplished. The Fairchild monoplane, described in the June issue of AIRCRAFT, has been fitted with a new 6-cylinder engine and succeeded in leaving the ground on September 4 with Mr. Walter Lowe Fairchild at the wheel

On August 30 Mr. Harkness officially notified the Aero Club that he would enter his Antoinette monoplane in the elimination race for the Gordon Bennett trophy. Harkness is the first entrant, Glenn H. Curtiss having been nominated because of his victory in winning the trophy the previous year at Rheims.

Mr. David L. Herman, of the Moffat Building, Detroit, Mich., is the inventor of a special wire used for trussing aeroplanes, and which is now in use on several of the best made machines.

Curtiss' flight over Lake Erie

Glenn H. Curtiss accomplished a wonderful flight on August 31, when he flew over water from Cleveland to Cedar Point, a distance of 64 miles, in 1 hour and 18 minutes, returning the next day over the same route in 1 hour 42 minutes. The wind was puffy both going and returning and Curtiss had quite a little difficulty in keeping to the course.

Another new machine which has recently flown is the L. A. W. Aeroplane Company's new flyer which was given a trial at Flint, Mich., on August 14.

The machine is the invention of Oliver A. Light and was piloted by him on its first flights. It is of the modified Farman type, temporarily fitted with wooden roller wheels for the first trials.

The H-De K Motor

A new aviation engine, designed by Messrs. Hopkins & De Kilduchevsky, of New York, is now on the market under the trade name of of the H.-De K. motor.

The motor is of the 4-cycle type, water-cooled and of very light weight. It is made in two sizes, a 4-cylinder 30-40-h. p., with a bore and stroke of 4½x4½, and a 4-cylinder 60-80-h. p., with a bore and stroke of 5¼x5¼. The weight of the 30-h. p. motor is 110 lbs., while the 60-h. p. weighs 160 lbs.

The cylinders are made of specially tempered steel. The pistons and rings are of the best grade of grey iron, heat treated to liberate molecular strains. All wearing surfaces are ground to the exact size.

The crank shaft is made of chrome nickel steel and the connecting rods are of drop-forged steel of special I cross section.

The motor is fitted with an aluminum alloy crank case. The crank shaft is supported on five bearings with a ball thrust bearing to accept propeller thrust.

The coupling is a special tapered joint, of a self-tightening, removable type. The cams are of drop-forged steel, machined and hardened. Both the intake and exhaust valves are of nickel steel drop-forged, and are mechanically operated from a single cam shaft.

The water jackets are made of spun copper and so attached as to be unleakable, and at the same time readily removable.

Oiling is accomplished by forced feed to cylinders and main bearings, and by splash lubrication to crank, connecting rods and wristpins.

The Johnstown Aero Company, of Johnstown, Pa., have purchased the patent rights of the Fritz Russ flyer and are building men-carrying machines of that type.

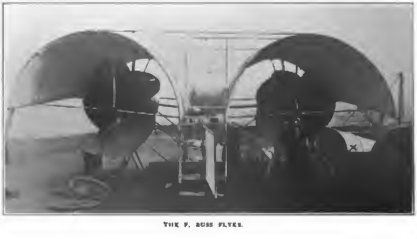
The ship is of novel design, being 39 feet long and 22 feet wide in rear and tapering to a point in front like a boy's dart.

It is constructed throughout of seamless steel tubing and is fitted with an Elbridge engine driving four spiral screw propellers.

International Aviation Tournament

By B. R. Newton

The Belmont Park race-track on Long Island, where many classic turf events have taken place, is rapidly being transformed into a flying field and made ready for the International Aviation Tournament, which will be held there from October 22nd to October 30th. All obstructions, such as trees, hedges, etc., are being removed from the infield, where a two-and-a-half kilometre course will be laid out for the main events. The five kilometre course over which the Gordon Bennett International Speed Trophy event will be flown on October 29th, leads away to the east and out over Floral Park, returning to the old race-track so that all the events, the start and finish of each contest,



THE F. RUSS FLYER.

OCTOBER.

Owing to a fault in the printing no margin was allowed between the second and third columns on page 296. The first paragraph reads:

"And now this great record has been made almost insignificant by the stupendous performances of this same Morane at Deauville on September 3rd, and of Chavèz at Issy on September 8th"———and the others accordingly.

LOUIS BARDELEAU'S KITE FACTORY AT PASSAIC, NEW JERSEY.

Two European countries, France and England, have named their contestants for the Gordon Bennett Trophy. Those from France are Alfred Leblanc, who will come over with a Blériot monoplane, and Hubert Latham and René Labouchere, each of whom will use Antoinettes. The English team, as now selected, is Claude Grahame-White, James Radley and Alec Ogilvie. Glenn H. Curtiss, who won the trophy in France last year, has been invited to head the American team without entering the elimination contest, and the other two members of the trophy-defending team will be selected from America's half dozen best aviators. Aside from the contestants in the international classic, applications have been received from half a dozen other Europeans and it is expected that before the time arrives for closing the entries at least a score of the best known aviators in the world will have been listed for the Belmont Park meeting.

The grandstand and other buildings at Belmont Park are being remodeled in such a manner as is necessary to accommodate the big crowds at that time of the year. All of the structures will be decorated in the colors of the various nations, additional boxes and reserved seats will be added and ample space provided for automobiles.

The Curtiss Flyers at New York

New Yorkers were given their first real aviation meet during the last two weeks in August at the old Sheepshead Bay race-track, Long Island, when Glenn H. Curtiss and his flock of birdmen, composed of J. C. "Bud" Mars, Charles F. Willard, Eugene B. Ely, J. A. D. McCurdy and Augustus Post, performed many daring and sensational, as well as novel and scientific, feats and evolutions with their Curtiss aeroplanes.

Several experiments that proved the aeroplane's value in a new sphere were successfully accomplished during the six days the birdmen were flying at the field.

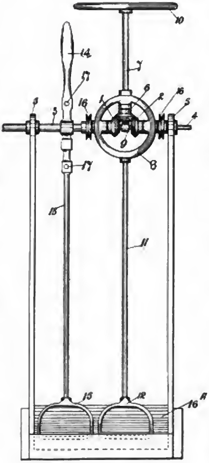
The meet opened on Friday, August 19th, and was originally intended to last but three days. Due to the splendid success of these three days and the great interest taken in the experiments by the public as well as by the aviators, the meet was extended and lasted three additional days: Friday, August 26th; Saturday, 27th, and Sunday, August 28th.

After the meet Curtiss, who went to Cleveland, made the 120 mile water flight from Euclid Beach to Cedar Point, Ohio, and return. Willard went to Boston, Post to Boston, Ely to Kalamazoo, Mars to Minneapolis, and Curtiss to Boston, following his over-water flight.

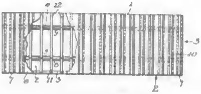
[illegible] B. HARMON STARTING ON HIS FLIGHT FROM MINEOLA TO GREENWICH, ACROSS LONG ISLAND SOUND.

Recent Patented Inventions

Briefed by Gustave R. Thompson



U. S. PATENT 965,289.



U. S. PATENT 965,491.

U. S. Patent 965,491, July 26, 1910. J. G. & F. Stites.

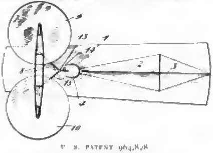
A construction of supporting plane. Instead of making the longitudinal cross-section curved, the planes are made angular after the manner of a hip-roof.

U. S. Patent 964,828. July 19, 1910. T. Windel.

A means for attaining lateral stability. Disk-shaped planes mounted at an oblique angle on vertical shafts.

U. S. Patent 965,289. July 26, 1910. J. L. Garsed.

Steering wheel arrangement for operating the steering and balancing planes of aeroplanes.



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The inventor will give any company or club plans for development and then have shares of its earnings. Write for full particulars to Jno. McDonald, Jr., Point Prim, P. E. I., Canada.

WANTED—Capital to build flying machine; exchange for part interest in invention, or will sell share; patent applied for; also most up-to-date folding umbrella, patent applied for. Address Flying Machine, Box 174, Washington, Va.

ELECTRICAL Gyroscope and aluminum aeroplane inventor desires financier for its construction. I claim projection in my invention, possibility of overturning in mid-air will be eliminated, ribs are invisible, resistance completely eliminated. For particulars address August S. Praube, 2516 Woodbrook Ave., Baltimore, Md.

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POSITION desired as Mechanical Superintendent with Aeronautical Engineering or Manufacturing Company, expert mechanic with technical education. A1 designer and draftsman. Resourceful, inventive, good executive. At present teaching machine-shop practice in a well-known Trade School. Age 31. Best of references. K. S., Care AIRCRAFT.

POSITION desired in Aeronautic factory as assistant, mechanic, electrician; woodwork a specialty; neat worker. A1 references. P. O. C., Care AIRCRAFT.

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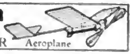

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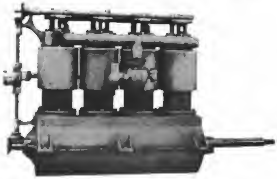

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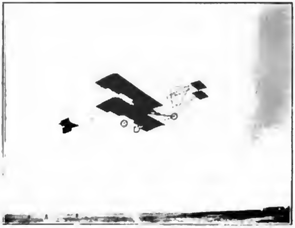

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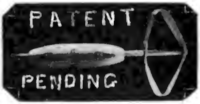

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Their features have perhaps another
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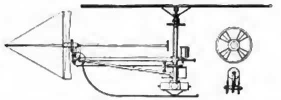

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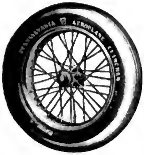

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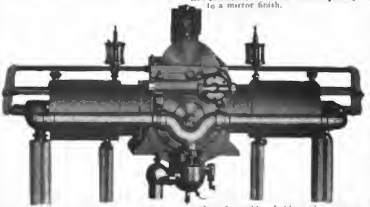

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Requa-Gibson Propellers

Our former advertisements have inaugurated to some extent the thought of *standardization* in aeronautic matters. They have evidently interested the aero man, for, as a primary result, we have secured large numbers of inquiries and orders; as a secondary result, we can show testimonials from *men who fly every day.*

In future, we shall advertise RESULTS, not promises. RESULTS are hard to imitate.

Our Proposition:

If you know what you want, we will supply it. If you are not sure, we will assist you to decide.

To Get Quick Attention,

enclose a small deposit (10% usual); this gets your order on file. You know our prices from former advertisements.

If you have already used one of our propellers, write and tell us about it at once, and your experience will perhaps help others. We will print your letter under this heading.

AIR-MEN WHO FLY EVERY DAY

Mr. George Schmitt of Rutland, Vt. says:

Rutland, Vt., Oct. 2, 1910.

The Requa-Gibson Co.,
225 West 49th St., New York.

Gentlemen: I purchased a propeller from you about three weeks ago; it was 7 feet in diameter with a 6-foot pitch, and take this opportunity of expressing my complete satisfaction with your propellers.

I do not know the exact amount of thrust developed, but the thrust was sufficient to raise my 30-foot Curtiss type biplane with a 40-foot run from a standing start in my first flight in an aeroplane.

As I am flying in different parts of Vermont, I have every opportunity of demonstrating your propeller, and would like to have the State agency.

Trusting I will get some particulars from you soon, as I have some business waiting, I remain,

Yours truly,
GEORGE SCHMITT.

The above performance was that of a Wittemann Plane, Elbridge Engine and Requa-Gibson Propeller.

Mr. C. C. Bonette of Passumpsic, Vt. says:

Passumpsic, Vt., Sept. 12th, 1910.

The Requa-Gibson Co.,
New York City.

Gentlemen: Your propeller received, tried out, and is the best thing I have ever seen in propeller line. We got 350 lbs. thrust with it. With the other propellers I only got 150 lbs. thrust, so that should tell the story.

I can honestly say that your propeller is so far ahead of the other that I would not have any other make on my machine than a Requa-Gibson.

I believe if more aviators were using the Requa-Gibson propeller there would be more successful flights made.

Wish you could be here to see your propeller lift my machine. We did not give the second one any test—just put it on, started the engine and the machine went into the air in less than 100 feet run. Can't say too much for your propellers—they are great.

Yours very truly,
C. C. BONETTE.

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WILL last from five to six times as long as a varnished balloon. The weight is always the same, as it does not require further treatment. Heat and cold have no effect on it, and ascensions can be made as well at zero weather as in the summer time. The chemical action of oxygen has not the same detrimental effect on it as it has on a varnished material. Silk double-walled VULCANIZED PROOF MATERIAL has ten times the strength of varnished material. A man can take care of his PROOF balloon, as it requires little or no care, and is NOT subject to spontaneous combustion. Breaking strain 100 lbs. per inch width. Very elastic. Any weight, width or color. Will not crack. Waterproof. No talcum powder. No revarnishing. The coming balloon material, and which, through its superior qualities and being an absolute gas holder, is bound to take the place of varnished material. The man that wants to have the up-to-date balloon must use VULCANIZED PROOF MATERIAL. Specified by the U. S. SIGNAL CORPS.

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The Three-States Aero Show

Announced to be held in Philadelphia October 22-November 5, has been postponed a few days because of the postponement of the International Contests at Belmont Park, and the consequent conflict of dates.

THE THREE-STATES SHOW

will be held **November 2-12, 1910 inclusive.** As this is only ten days instead of two weeks, a reduction of 25 per cent. in the prices of all floor spaces has been made. Spaces can be subdivided to suit exhibitors and any desired number of square feet can be secured, whether small or large. If you desire to make such an arrangement, address the manager,

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Aero Club of Pennsylvania **Betz Building, Philadelphia**

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The "Wizard of Aviation"

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200 to 1300 R. P. M.

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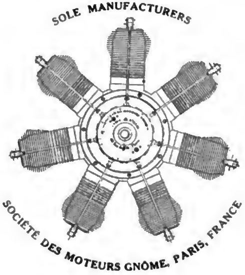

Light in design
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50 H. P.,
Weight 167 lbs.

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Weight 220 lbs.

Perfect in
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No engine troubles
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ORDER IMMEDIATELY TO SECURE EARLY DELIVERY

BIPLANE HURTS TWO.

Propeller of Barton's Machine Strikes Gaskell and Phillips.

Special to The New York Times.

HEMPSTEAD, N. Y., Sept. 12.—George Phillips, head mechanic for Samuel Barton, the builder of the smallest biplane in the world, which, with its two-cylinder motor, weighs only 400 pounds, had a narrow escape from death this afternoon. Barton had brought his biplane to the field here to try it out. Gaskell advised

---

MR FRISBIE'S FLIGHT WRECKS HIS MACHINE

Captain Baldwin and Mr. Hamilton in a Little Impromptu Race.

Captain Thomas S. Baldwin and Charles K. Hamilton had a race for seven laps about the course on the aviation grounds at Garden City last evening, and when the last quarter mile had been finished the men were so nearly together that no decision was given as to who was the winner. Captain Baldwin's Red Devil was the speedier biplane, but the Curtiss machine, driven by Mr. Hamilton, was so cleverly handled at the turns that gains were made at these points which were lost in the long stretches.

John J. Frisbie, of Rochester, N. Y., who, as a beginner, made seven laps yesterday morning, was on the field again in the evening, but met with a mishap when one of the wheels of his running gear went into a hole. The wheel collapsed and threw the biplane on its left side, breaking off both the left planes and three ribs of the right lower plane. Mr. Frisbie hopes to be out again this evening, when Mr. Hamilton will try to circle the

---

NEW FLYER ARRIVES.

and Castle Joins Long Island Aviation Colony.

GARDEN CITY, N. Y., Sept. 8.—Rudolph Castle in a biplane of C. E. Delong of Rochester, N. Y., joined the aviation

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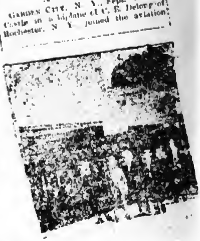

NIGHT FLIGHTS AT HEMPSTEAD

Frisbie Makes a Record on a Mere Ten Days' Education

Special to The New York Times.

AVIATION FIELD, HEMPSTEAD PLAINS, L. I., Aug. 30.—After only ten days' preliminary education J. J. Frisbie demonstrated to-night his right to be called an aviator. Frisbie's flight to-night is a wonder to all those who have watched his short career. It took him just two weeks to build his plane. This was followed by repeated mishaps and disappointments. Frisbie capped these experiences of a month, all told, by taking out his aeroplane to-night and flying in the altitude usually maintained by Clifford B. Harmon during his exhibitions here. He flew from the field over the neighboring lots, and over the roof of the Meadow Brook Club, disappearing from sight. When he came back and descended he had to shake hands with an enthusiastic gallery.

Joe Seymour also made a good flight to-night. He reached a good height running on three cylinders. Seymour had difficulty in making his left turn and once was forced to make an extra lap of the field in order to make his landing.

Tod Schriever again took out the Curtiss machine and flew over to the Meadow Brook Club and back. This morning he had the machine out and broke up the front control near the motor.

Frisbie leaves here to-morrow for Rochester, his home, where a meeting has been arranged. he goes on to

---

AVIATOR DRIVES AT QUARRY

Hamilton Resumes Old Tricks at Garden City Field.

Charles K. Hamilton was at his old tricks last night at the Garden City aviation field. While sailing around the field at a height of about a hundred feet he noticed two men walking toward the Aeronautical Association's shed, at the Mineola end of the field, and dipped down at full speed toward them. The two men ducked and ran, but the daring aviator followed them, and, as he came within a few feet, raised his control and flew up again, to the enjoyment of the spectators.

Hamilton made three flights altogether.

Tribune Aug 4

J. J. Frisbie, of Rochester, wreck of Monday evening, had his machine out last night, and, after running it across the field, covered the field three-quarters of the way out, and made a good flight and alighted gracefully in front of the grandstand.

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C. K. Hamilton and Captain Baldwin Give Remarkable Performance at Garden City.

FRISBIE HAS HARD LUCK

Special Dispatch to The Morning Telegraph.

GARDEN CITY, L. I., Aug. 22.—C. K. Hamilton and Capt. Thomas S. Baldwin engaged in an aeroplane race at this place to-night. After doing seven laps of the course,

Frisbie Breaks Machine.

Just before leaving the ground to-night, however, the wheels of his machine ran into a soft spot and buckled, resulting in the breaking of two planes and a couple of ribs on the right side.

THE ESSEX PRESS, PRINTERS
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AIRCRAFT

Vol. 1 DECEMBER, 1910 No. 10

MAKING FOR THE LINE, AT BELMONT PARK

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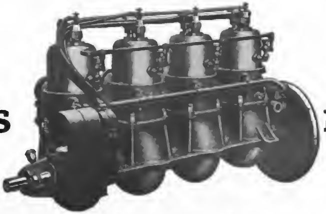

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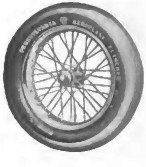

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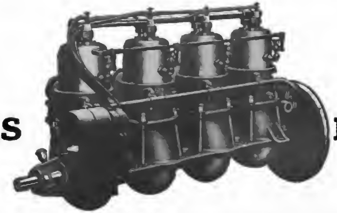

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A SMALL PORTION OF THE CROWD ATTENDING THE INTERNATIONAL AVIATION MEET AT BELMONT PARK.

The second pylon is visible at the top and to the left. It was when just abreast of this mark that Leblanc's fuel ran out in the Gordon Bennett Cup Race. For some reason, probably an involuntary pressure on the foot-tiller, his monoplane swerved to the right and crashed into a telephone-pole when a few feet from the ground, at the end of the line of motors visible in the picture and near the stables which can be seen between the track and the roof of the grandstand. It will be seen that Leblanc was on the finest and widest part of the course when the incident occurred which brought about the accident.

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AIRCRAFT

Vol. I. No. 10 New York, December, 1910 15 cents a copy
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THE INTERNATIONAL AVIATION MEET

Belmont Park, New York, October 22d-30th

(Second Article)

By G. F. Campbell Wood

HANGAR ROW AT BELMONT PARK: TWENTY SHEDS AND FOUR TENTS HARBORED THE FORTY-THREE MACHINES AT THE MEET.

To begin with, the International Aviation Meet was a success—a success from the viewpoint of the sportsman as well as from that of the scientist, of the soldier,—to say nothing of that of the spectator.

Financially, it paid for itself, which is more than can be said of almost any other tournament of the kind.

The disagreements between aviators and management were no more and no less than those which have occurred at other similar meets abroad, the difference being that in Europe they are not touched on by the press whilst here this can hardly be said to be the case. As a proof of this assertion it need only be said that the Rheims meet of this year was followed by twenty-two lawsuits! This merely means that flying competitions are increasing in scope and importance faster than regulations and legislation can be formulated to adequately govern them.

THE GORDON BENNETT CUP.

Among all the events decided at the big meet one stood out as of paramount importance to the followers of the new sport: the Coupe Internationale d'Aviation, better known as the Gordon Bennett Cup, carried with it, by tacit consent of the various national bodies governing aeronautics in their respective countries, the blue ribbon of the sport and the World's Championship, and it must be said that the race fulfilled the expectations of the most sanguine.

By his magnificent victory, Claude Grahame-White increased his fame and prestige to an extent which the aviator himself probably hardly realizes at this time. For many months to come, months during which the number of men who fly will increase by the thousand, the winner of the Gordon Bennett Cup will be looked upon as the official world's champion.

Leblanc's mishap in the last lap of the big race—which without question cost him the Cup—has caused many to overlook the performance of the winner, in their sympathy for the loser and their appreciation of his almost unheard-of ill-luck in running short of gasoline when leading his rival by five minutes and a quarter within forty-six hundred yards of the finish.

The fact remains, however, that Grahame-White's performance in itself was of a sterling character; he had never driven his 100 H.P. racer until the previous day and was nevertheless the first to decide on an early start on the Saturday—not taking the chance of the wind increasing later.

As he became more accustomed to his mount his times improved lap by lap and at thirty kilometres he was inside Morane's world's record for the distance; this was at 9.02 a. m.; one minute later Leblanc flashed by at the end of his first lap, smashing all records, but to Grahame-White had gone the distinction of making the first successful onslaught in this country on any world's speed record.

Grahame-White continued making new world's figures until the finish, while a few minutes later Leblanc, traveling six miles an hour faster, one by one obliterated the short-lived records.

Leblanc had been flying 53' 15" when having to land through lack of fuel, he swerved off the track and smashed into a telephone pole; had he had the half-gallon of gasoline which would have carried him past the finishing post a winner, his time would have been between 55' 30" and 56'!—but to those who think that no warning was given to the Cup defenders that such startling time might be expected, the writer feels it only common justice to himself and to this magazine to refer to an article which occurred here *three months* ago (pages 247-248 of this volume) in which he referred to the Gnôme-Blériot as the logical favorite in the Cup race and warned the readers of AIRCRAFT not to take the time in the French Eliminatories (1 hr. 19') as a criterion of what the defenders would have to beat, but to consider that *"fifty-six minutes"* (nearly 30% faster) was what Leblanc's 100 H. P. Blériot would be capable of when the time came to fight for the Cup.

The tables published in this number of AIRCRAFT give all the figures of importance in connection with the Cup race, the most interesting features of which were unfortunately all over at ten in the morning, as foreshadowed here last month. Interesting comparisons can be made between the racers; in point of speed they ranked as follows: Leblanc, Grahame-White, Latham, Ogilvie, Drexel, Moisant. Latham's 16-cylinder Antoinette, although much faster than his 50 H.P. machine could not come anywhere near the 14-cylinder Blériots; it is even probable that had Aubrun been free to start, he would, on his 50 H.P. machine, have outdistanced Latham: Latham's time for 70 kilometres—just before he made his stop—was 47"⅘ behind Morane's record for the distance made on a 50 H.P. Blériot, and on a track of one-half the perimeter.

The "Baby" Wright biplane driven by Ogilvie, was propelled by the regular four-cylinder engine of 25-30 H. P.; it showed, however, greater speed than either Drexel's and Moisant's Blériots, and this notwithstanding the fact that, in Drexel's case, very small wings were used—probably too small for safety in case of engine-trouble. (These were the wings, by the way, which Jacques Balsan used on the first Blériot specially built to carry a Gnôme motor.)

Of course, neither Drexel nor Moisant have much experience as aerodrome-racers, their specialties being altitude and cross-country contests respectively, and Ogilvie was many minutes outside of the times which men like Morane, Aubrun, Cattaneo and perhaps Simon could have made with 50 H.P. Blériots; but taken all in all the little Wright was a revelation for speed and the question naturally arises, when the performance of the four-cylinder machine is noted, as to what Brookins would have done in the Cup race, with the eight-cylinder biplane, had not four cylinders gone dead during a preliminary trial* and the little machine, rather too near the ground for a good glide and striking it at too sharp an angle, not smashed itself beyond hope of immediate repair.

In practise this biplane was caught by several watches 1' 25" for the 2.500 metre course and was timed 1' 26"½ by official watches; although Grahame-White subsequently did as well as this and even better (1' 23"⅗ for the last lap of the Grand Speed final on October 31st) there seems little doubt that Brookins, barring engine-trouble, would have gone faster than he did during the Cup race, (2' 55"⅘ was Grahame-White's fastest Gordon Bennett lap—say 1' 27" 9/10 for 2,500 metres). Whether Brookins would have taken Leblanc's measure, is another question altogether; both machines go between 70 and 80 miles straightaway and it is a pity that the defenders were not as far advanced in their preparations in tuning up for the big race as some of the challengers.

Hamilton did not even cross the line in time to compete and his poor showing—due primarily to an engine which refused to keep *warm* enough was the big disappointment of the Meet.

Hamilton's speed has never been accurately gauged, although 1' 29" has been quoted as his time for one lap of the 2,500 metre course.

The Curtiss monoplane was not ready: it first got off the ground (with Curtiss himself at the wheel) on the day after the Cup race.

SPEED IN OTHER EVENTS.

Outside of the Cup race, the best speed was shown in the Grand Speed events; Grahame-White was flying a mile an hour faster around the small track on the Sunday—the morrow of Cup race day—than during the big race itself, and two miles an hour faster on the Monday than on the Sunday, showing consistent improvement in tooling the craft around the pylons and getting everything out of the fourteen whirling cylinders that was to be got out of them. Aubrun also did well in the Grand Speed and had the "Fastest Flight" competition counted in these events, instead of only in Hourly Distance events, the time credited to Grahame-White and to Aubrun would have been respectively 5' 41"⅕ and 6' 33", instead of 6' 02"⅕ and 6' 55".

Grahame-White's 1' 34" ⅗ for 2,500 metres on a circular course with a *standing start*, was also an interesting achievement.

Another who improved in speed after the Cup race was Latham: Latham had not tried out his racer since leaving France until the morning of the race, and although he made a remarkably fast trial then—perhaps the best speed shown by this machine at Belmont Park—it was only on the next day that he got the big monoplane going at its best gait for any length of time.

Probably but few who witnessed Latham's flight in the hourly distance event that day, realized that he was gaining through it an eleventh hour victory in no less than three of the general events. By covering a greater distance in the hour (33 laps—82,5 kilometres) than had been achieved on the small course at any time throughout the meet, Latham just managed to beat out Grahame-White for first place in the General Totalization of Distance, by a single lap!

Furthermore, he roared over the line at the conclusion of his thirty-third lap exactly 3"⅓ before the bomb announcing the end of the hour; it is by this margin that he avoided a dead-heat with Grahame-White in the big prize, for only full laps (completed before the end of the hour) were credited.

Another victory gained by him in this flight was that for second place in General Totalization of Duration over Grahame-White (Hoxsey being far in the lead for first place); he won out by just twelve and a half minutes on this.

The third count on which Latham improved his showing at the meet in this self-same effort was in the "Fastest Flight" contest (the best time on four consecutive laps in any regular hourly distance contest).

In perhaps the finest piece of driving and of "banking" of the whole meet, Latham, with this prize especially in view, shaved the pylons for four perfectly even laps, the time being returned as 6' 26" 1/10, thus giving him second place to Grahame-White and doing better than Aubrim and the other Blériot racers, who had easily led him while he did not have his 100 H.P. racer.

The reference to these four laps as being "perfectly even," is made advisedly: their times were respectively: 1' 36"⅕, 1' 36"½, 1' 36"⅘, 1' 36"½!

What a 50 H.P. Blériot can do on a 2500 metre course when handled by a crack aerodrome-driver was shown the next day when Aubrun made a lap in 1' 36"⅕, thus equalling Latham's time for his fastest lap on his 100 H.P. racer. Another fast lap of a 50 H.P. was one by Radley in 1' 40"9/10.

A careful perusal of the timing sheets of both aerodrome and cross-country events, kindly placed at the writer's disposal by Mr. C. M. Manly, would indicate that the four fastest 50 H.P. Blériots were, in the order named: Leblanc's (sold to Moisant), Radley's, Aubrun's (since sold to Hamilton), and Drexel's (with small wings).

On the aerodrome, however, Aubrun's superior handling made him easily the fastest: his Blériot was the only 50 H.P. machine which in the "Fastest Flight" competition finished ahead of McCurdy's racing Curtiss—the swiftest biplane at Belmont Park outside of the special Gordon Bennett racers.

CROSS-COUNTRY FLIGHTS.

In cross-country flying John B. Moisant showed himself the star of the meet.

It is not in circling an aerodrome for mile after mile that Moisant shines—although his work in this line of competition shows constant improvement—; it is in feats of flying which require daring, decision, initiative and tenacity, an appreciation—both swift and clear—of ways and means to accomplish his purpose and a keen sense of direction and location.

There is perhaps, an element of recklessness in his handling of a Blériot which makes the more cautious of his fellow bird-men shake their heads and make gloomy predictions, but the fact remains that the large proportions of Moisant's repair-bills can be traced more to his lack of long experience in flying rather than to any lack of foresight or calculation on his part. In the coming months it is cross-country flying which is going to hold the

---

* *Almost every account of this accident refers to its having occurred as Brookins started in the Cup race, and on the strength of this, many of those at Belmont Park, both American and foreign, questioned Moisant's eligibility to start as a substitute. As the Starter of the meet, the author is better qualified than any, to assert, either unofficially or officially, that no entry for the Cup race was received from Brookins, who was merely taking a practise spin: the naming of a substitute to replace him was therefore absolutely regular. In view of the foreign notice given to the misinformation, a statement on the subject is not superfluous.*

THE "BABY" WRIGHT RACER: THE EIGHTY-MILE-AN-HOUR, EIGHT CYLINDER, SIXTY HORSE POWER, TWENTY-ONE FOOT SPREAD SPEED-PRODUCT OF THE FAMOUS BROTHERS—ORVILLE WRIGHT AT THE HELM.

interest of the world to the exclusion of racing over aerodromes and in this field Moisant has, barring accidents, at least as great a future as any aviator living.

It is, of course, the Statue of Liberty prize which is thought of when Moisant's *rôle* in the Belmont Park Meet is broached, but to the mind of the writer this feat, great as it was, does not compare in sheer merit to that accomplished by the same great little flyer on the first day of the meet: Moisant's cross-country flight on October 22d, in the fog and rain, which netted him just one twentieth of the amount of the Statue of Liberty prize, is one of the finest feats in the annals of aviation, and how he ever found his way back to the aerodrome after those forty minutes he was speeding through the mist over the open country, is something such men as Aubrun—the second of the Circuit de l'Est—and de Lesseps—the second man to cross the Straits of Dover—are still wondering.

It was a case where a slow-speed machine showed an advantage, for had Moisant been using a single-seater instead of a pigeon-tailed Blériot, it is certain his difficulties in keeping his course would have been materially increased.

The greatest feature of Moisant's flight in the Statue of Liberty Prize, to compete in which he hastily purchased Leblanc's 50 H.P. Blériot, was not the daring required to enter, on a machine in which he had never previously sat, in the most dangerous aviation contest held since Chavez—whose name will long survive him—crossed the Alps at the Simplon Pass, it was rather the amazingly straight course steered by him over the maze of buildings stretching out for miles and miles ahead of him. How straight this course was may be gauged by the fact that, although a perceptible breeze was blowing, his average speed as calculated over the straight-line distance between start and finish (35 miles, including the circuit of the aerodrome at the start) figures out at 60.6 miles an hour. This is at least two miles faster than any 50 H. P. Blériot was supposed to be capable of, and outside of showing Moisant's wonderful steering, indicates how fast a 50 H. P. machine Leblanc (who, as all the world knows, is Blériot's right-hand man and gets the pick of the Blériot output) had in reserve for the Gordon Bennett Cup, in case he failed to get his 100 H. P. properly tuned up. As mentioned above there is thus little question that Moisant now owns the fastest 50 H. P. Gnôme-Blériot in existence; it had already shown its speed at St. Louis prior to the meet when Leblanc made a mile straightaway in 53", with what was supposed to be a ten or eleven mile wind back of him—but which in the light of Moisant's performance, may have been of considerably less strength.

Radley was another who did sterling work in cross-country flying; he bids fair to become a specialist of the very first calibre in this line; no other flyer came within ten per cent of equalling the time he made over the regular Cross-Country 17 mile course, on the fourth day of the meet.

Aubrun, Latham and De Lesseps upheld their reputations as cross-country men, whilst Grahame-White's nerve in piloting his 14 cylinder racer in the Statue of Liberty prize, even if he did not steer as dangerously straight a course as Moisant (who flew over the whole length of Brooklyn) was of the order of that which first made him world-famous in the London to Manchester flight.

It need hardly be expected to see in these columns an assertion that had Grahame-White taken the very shortest route like Moisant, he would have won the big prize; it is the purpose of this article to point out some features of the meet from which conclusions of interest may be drawn and not to make such obvious statements as that Grahame-White's 100 H. P. is faster than Leblanc's, Moisant's or anybody else's "50."

The cross-country events were over too short a distance for the Wright machines of the regular pattern to have a chance in them for speed and the Statue of Liberty prize is not one which the Wright brothers would have entered machines in, owing to their well-known principle of not flying over cities—a principle which by the way, should be upheld by legislation, *before* a bad accident makes it a necessity (and at the same time hurts the cause of aviation).

ALTITUDE.

The altitude performances at Belmont Park have been kept to the last in this general summary of the results as being the greatest feature of the meet.

In no previous aerial tournament, whether Buda-Pest, Rheims, Bournemouth, Lanark, the Baie de la Seine or Bordeaux, where the greatest struggles for height took place, has high flying of such excellence or on such a scale been witnessed.

De Lesseps and Drexel put up the great fight which was expected of them on their previous records, but they did not in any way make the clean sweep generally expected of them, for the "good home-made American biplanes" adequately fulfilled the confidence here expressed last month that they would more than hold their own.

The altitude contests were in fact an absolute triumph for the Wrights; no wind stopped them and Johnstone and Hoxsey started out daily on their victorious climbs with the regularity of clock-work.

During the meet Hoxsey stayed up longer in the air than anyone and his totalized altitude reached well over *eight miles*, but to his team-mate Johnstone, went the greatest honor of the tournament when in its last hour he climbed to *nine thousand, seven hundred and fourteen feet* above the level of the aerodrome—a world's record by over five hundred feet.

Johnstone used the Wright 26 feet-spread biplane—an intermediary between the racers (21 foot for the eight cylinder and 22 foot for the four) and the ordinary type (39 foot). Earlier in the meet (October 24th) Brookins had made a hard landing with this machine when his engine had stopped at about 5,000 feet, and a swift glide of the small surface flier had ended far out of the aerodrome, with some damage. Since the

LATHAM'S SIXTEEN CYLINDER 100 HORSE POWER ANTOINETTE MOTOR AND NORMALE PROPELLER.

LEBLANC

who broke the World's Speed Record at Belmont Park, on his 100 H. P. Gnôme-Blériot monoplane: 67.868 miles an hour.

JOHNSTONE

who broke the World's Altitude Record at Belmont Park, on his 30 H. P. 26-foot Wright Flyer: 9,714 feet. Johnstone is the only American to hold a World's Record.

LATHAM

the famous driver, whose masterful handling of his monoplanes amazed New Yorkers.

big meet Hoxsey, at Baltimore, landed also at too steep an angle on this machine, being thrown out at the end of a glide; an engine at work at the moment of landing—as Johnstone had it on ending the glide which brought him down from 9,714 feet—is a strong desirability in these small surface machines, although a further acquaintance with them might enable aviators to do the trick without damage.

Prior to Johnstone's record-breaking flight on October 31st, Orville Wright had himself taken out the flyer to test its climbing speed; the remarkable results obtained justified the estimate that Johnstone might have reached 12,000 feet, had he kept climbing throughout the flight.

In the same contest, for which unfortunately there was no second prize, Drexel made a magnificent attempt, which through being overshadowed by the record-breaking feat did not receive the notice it deserved. Climbing for over an hour—longer than any Blériot had ever climbed—Drexel took his monoplane to 8,373 feet, 1,750 feet higher than his record-breaking flight at Lanark in July, 1,268 feet higher than his own American monoplane record, established a week earlier, and within 30 feet of Chavèz's world's monoplane record.

Brookins' magnificent altitude flight at Atlantic City when he established a world's record of 6,171 feet which stood for many weeks and remained an American record until the Belmont Park meet, was surpassed *nine* times at the meet, three times by both Johnstone and Hoxsey, twice by Drexel and once by De Lesseps, whose 6,900 feet flight on October 25th, should not be forgotten.

The American record varied at follows, during the meet:

7,105 feet Drexel	....	October 24
7,303 " Johnstone	....	" 25
8,471 " "	....	" 27
9,714 " "	....	" 31

One great feature in the success of the altitude contests was the exclusive use of barographs for gauging the heights reached. How perfect were the precautions taken to insure accuracy can only be appreciated by those who were in close touch with this side of the meet; that they were not in vain may be taken from the fact that when two different instruments were carried up the results obtained were practically identical. On only one occasion did a barograph fail to do its work and then it was quickly noticed by the aviator—Latham—,who came down for another. The only time a height was not recorded was when Johnstone, at the moment of starting up, decided to go for altitude instead of distance, and forgot to apply for a barograph.

It had been originally intended to measure heights from the ground and those who know how strongly the writer urged the exclusive use of barographs, will appreciate why their adoption and successful use were so pleasing to him.

A REMARKABLE DEMONSTRATION.

Had the International Meet taken place a year ago, and with the same weather conditions as prevailed this year, there is little doubt that it would have proved a hollow failure. There was not a day during the meet that the anemometer cups were not racing around at a lively clip, but on only one day did the wind keep the machines in their hangars—and had it not been Sunday, it is possible that even on this day, some of Wright flyers might have gone up.

On the sixth day of the meet when the wind was blowing gustily anywhere from 15 to 30 miles an hour near the ground and Latham was giving a magnificent exhibition of control and wind-fighting, around the pylons, Johnstone and Hoxsey rose together for altitude and once above the lower reaches and its treacherous eddies, soared in the blue, keeping a perfectly even keel in the more regular currents aloft.

They faced the wind coming in from the ocean and as they went higher their speed in relation to the ground rapidly diminished as that of the air they were meeting became greater. Soon they appeared to be standing still, the velocity of the wind being just even to theirs (about 38 miles) and then, as they went higher, they started to lose ground and the higher they went the faster they went backwards! Close together in the heavens they appeared like two great kites on a string—a string being slowly paid out.

How great a wind Johnstone faced at his maximum altitude of 8,500 feet, no one can say, but with his machine going close on forty miles an hour, he was blown backwards some forty miles in the course of less than two hours, and seventy-five miles an hour is not an exaggerated estimate of the maximum velocity of the wind met by him. As has, however, often been pointed out here it is not the actual velocity of the wind but its character which counts; a wind of 75 miles an hour on the ground would mean a storm jumping in a few seconds from 40 to 90 miles among buildings and trees, and one in which present-day flying machines could not live an instant.

The real lesson of these two astonishing flights was the inadequacy of the power-plant of the big biplanes to stem the winds they could so easily fly in.

The Wrights do not believe in high-speed machines, but without going to extremes, how could a 33-foot spread two-seater eight cylinder Wright do? Its 55 miles an hour would increase the radius of action to no small degree and make it an ideal scouting machine, for military use.

There is one side of the success of the International Meet which has not been touched on; its remarkable freedom from serious accident. With the magnitude of the competitions it had been feared that perhaps America's enviable record of not a single fatality since the death of Selfridge might be broken in the keenness of the struggles.

Not only did this not occur but the only man really hurt, Brookins, is, it is pleasant to learn, rapidly improving. All other damage was strictly confined to the machines themselves and this itself was considerably less than that which usually attends a tournament on this scale.

It has in no sense been aimed at in this article to give an account of the meet day by day and event by event—a relation which practically every newspaper in both hemispheres has afforded its readers—but rather to bring out the salient points of the big tournament—those which have given it a lasting place in American aeronautic history.

For the rest the full results given below are probably the most accurate and complete records published and can be readily recommended as an unimpeachable reference on all questions relating to the events contested.

G. F. Campbell Wood

RESULTS OF THE MEET

EVENTS DAY BY DAY

FIRST DAY—OCTOBER 22nd.

FIRST HOURLY DISTANCE.

1st Prize,	$250.	Grahame White,	50 kilometres (in 57' 37", 20)
2nd "	100.	Moisant,	35 " (in 51' 02", 40)
3rd "	50.	Drexel,	25 " (in 19' 39", 80)

FIRST HOURLY ALTITUDE.

1st Prize,	$250.	Hoxsey,	742 feet
2nd "	100.	Ely,	404 "

SECOND HOURLY DISTANCE.

1st Prize,	$250.	Grahame-White,	47.5 kilometres (in 56' 22", —)
2nd "	100.	Moisant,	35 " (in 49' 32", 40)

SECOND HOURLY ALTITUDE.

1st Prize,	$250.	Hoxsey,	673 feet
2nd "	100.	De Lesseps,	628 "
3rd "	50.	Drexel,	519 "
		Ely,	206 "

CROSS-COUNTRY.

Moisant, the only starter, did not find balloon but was awarded the amount of the first prize ($500); his flight lasted 39' 41", 80.

DAILY TOTALIZATION OF DURATION (1st Day).

1st Prize,	$500.	Grahame-White,	2 hours
2nd "	250.	Moisant,	1 hr. 42' 10", 80
3rd "	100.	Hoxsey,	34' 35", 40
		Drexel,	20' 31", 80
		De Lesseps,	3' 47", 80

SECOND DAY—OCTOBER 23rd.

No flights on account of wind.

THIRD DAY—OCTOBER 24th.

FIRST HOURLY DISTANCE.

1st Prize,	$250.	Drexel,	70 kilometres (in 54' 33", 40)
2nd "	100.	Aubrun,	67,5 " (in 48' 10", 65)
3rd "	50.	Johnstone,	52,5 " (in 56' 43", 00)
		Hoxsey,	52,5 " (in 57' 10", 60)
		Grahame-White,	50 " (in 55' 18", 20)
		Latham,	12,5 " (in 11' 04", 85)
		Brookins,	7,5 " (in 5' 30", 85)

FIRST HOURLY ALTITUDE.

1st Prize,	$250.	De Lesseps,	5,615 feet
2nd "	100.	Brookins,	4,882 "
3rd "	50.	Willard,	629 "
		Ely,	412 "

SECOND HOURLY DISTANCE.

1st Prize,	$250.	Latham,	52,5 kilometres (in 47' 56", 40)
2nd "	100.	Grahame-White,	52,5 " (in 57' 58", 20)
3rd "	50.	Aubrun,	50 " (in 35' 53", 40)
		Hoxsey,	47,5 " (in 55' 20", 00)
		Johnstone,	45 " (in 46' 52", 80)
		Radley,	5 " (in 3' 38", 20)

SECOND HOURLY ALTITUDE.

1st Prize,	$250.	Drexel,	7,105 feet.

GRAND SPEED—25 KILOMETRES.

Elimination Heat for Biplanes.

1st	McCurdy,	19' 49", 20
2nd	Mars,	22' 54", 15
	Frisbie,	(5 kilometres in 4' 30", 21) did not finish.

DAILY TOTALIZATION OF DURATION (2nd Day).

1st Prize,	$500.	Hoxsey	1 hr. 57' 13", 20
2nd "	250.	Grahame-White,	1 hr. 56' 48", 80
3rd "	100.	Johnstone,	1 hr. 47' 44", 40
		Aubrun,	1 hr. 26' 51", 55
		Drexel,	1 hr. 02' 16", 20
		Latham,	59' 03", 25
		De Lesseps,	27' 24", 80
		Willard,	6' 36", 80
		Brookins,	5' 30", 85
		Radley,	4' 15", 80

FOURTH DAY—OCTOBER 25th.

FIRST HOURLY DISTANCE.

1st Prize,	$250.	Latham,	47,5 kilometres (in 57' 31", 00)
2nd "	100.	Grahame-White,	5 " (in 6' 37", 35)

FIRST HOURLY ALTITUDE.

1st Prize,	$250.	De Lesseps,	6,931 feet
2nd "	100.	Hoxsey,	5,796 "

Johnstone also flew for altitude but did not regularly enter or apply for a barograph.

SECOND HOURLY DISTANCE.

1st Prize,	$250.	Grahame-White,	35 kilometres (in 34' 16", 85)
2nd "	100.	McCurdy,	30 " (in 21' 43", 35)
3rd "	50.	Mars,	30 " (in 30' 47", 40)
		Simon,	10 " (in 7' 23", 50)
		Leblanc,	7,5 " (in 5' 18", 85)

SECOND HOURLY ALTITUDE.

1st Prize,	$250.	Johnstone,	7,303 feet
2nd "	100.	Hoxsey,	4,882 "
3rd "	50.	Latham,	3,772 "

CROSS-COUNTRY.

1st Prize,	$500.	Radley,	19' 48", 45 for about 17 miles.
2nd "	250.	Moisant,	58' 25", 95

DAILY TOTALIZATION OF DURATION (3rd Day).

1st and 2nd Prizes.	$375.	Hoxsey,	2 hours
	375.	Johnstone,	2 hours
3rd Prize,	100.	Latham,	1 hour
		De Lesseps,	46' 05", 80
		Grahame-White,	41' 48", 05
		Mars,	31' 15", 10
		McCurdy,	23' 09", 85
		Simon,	7' 23", 50
		Leblanc,	5' 37", 50

FIFTH DAY—OCTOBER 26th.

CROSS-COUNTRY.

1st Prize,	$500.	Aubrun,	28' 08", 75
2nd "	250.	Latham,	32' 14", 71
3rd "	100.	Drexel,	43' 07", 75
		De Lesseps	did not round balloon
		Leblanc	did not round balloon

SPECIAL HOURLY DISTANCE.

1st Prize,	$250.	Latham,	42,5 kilometres (in 36' 22", 45)
2nd "	100.	Parmelee,	40 " (in 57' 37", 03)
3rd "	50.	Brookins,	30 " (in 22' 40", 80)
		Grahame-White,	20 " (in 18' 04", 75)
		Simon,	15 " (in 11' 40", 90)
		Mars,	2,5 " (in 2' 02", 80)

SPECIAL HOURLY ALTITUDE.

1st Prize,	$250.	Hoxsey,	6,233 feet
2nd "	100.	Johnstone,	5,813 "
3rd "	50.	De Lesseps,	2,549 "

RESULTS OF THE MEET—Continued

SIXTH DAY—OCTOBER 27th.

HOURLY DISTANCE.

1st Prize,	$250.	Latham.	35 kilometres (in 55' 24", 15)

HOURLY ALTITUDE.

1st Prize,	$250.	Johnstone,	8,471 feet
2nd "	100.	Hoxsey.	6,903 "

SPECIAL ALTITUDE.

1st Prize.	$250.	Brookins,	742 feet

DAILY TOTALIZATION OF DURATION (4th Day).

1st, 2nd	$283.33.	Hoxse
and 3rd	283.33.	Johns
Prizes	283.33.	Latha

SEVENTH D

FIRST HOURLY DISTANCE.

1st Prize,	$250.	Latha
2nd "	100.	Auden
3rd "	50.	De Le

FIRST HOURLY ALTITUDE.

1st Prize,	$250.	Hoxse
2nd "	100.	Parme

SECOND HOURLY DISTANCE.

1st Prize,	$250.	Latha

SECOND HOURLY ALTITUDE

1st Prize,	$250.	Parme
2nd "	100.	De Le

DAILY TOTALIZATION OF DI

1st Prize,	$500.	Parme
2nd "	250.	Latha
3rd "	100.	Hoxse
		De Le
		Auden

EIGHT DA

GORDON BENNETT CUP. See page 339.

FIRST SPECIAL ALTITUDE.

1st Prize,	$500.	Hoxsey.	5,146 feet
2nd "	250.	Johnstone.	3,235 "

SECOND SPECIAL ALTITUDE.

1st Prize,	$500.	Hoxsey,	4,644 feet
2nd "	250.	Johnstone,	4,091 "

NINTH DAY—OCTOBER 30th.

HOURLY DISTANCE.

1st Prize,	$250.	Latham,	82,5	kilometres	(in 58' 48", 41)
2nd "	100.	Moisant,	70	"	(in 54' 34", 05)
3rd "	50.	McCurdy,	45	"	(in 32' 35", 99)
		Aubrun,	30	"	(in 21' 13", 35)
		Grahame-White,	27,5	"	(in 17' 00", 09)
		Ely,	10	"	(in 8' 20", 81)

HOURLY ALTITUDE.

1st Prize,	$250.	Simon,	959 feet
2nd "	100.	Barrier,	932 "
3rd "	50.	Radley,	614 "

DAILY TOTALIZATION OF DURATION (6th Day).

1st Prize,	$500.	Latham,	58' 51", 74
2nd "	250.	Moisant,	54' 56", 85
3rd "	100.	McCurdy,	32' 37", 16
		Aubrun,	21' 13", 35
		Grahame-White,	18' 24", 23
		Simon,	11' 20", 80
		Ely,	8' 20", 81
		Radley,	6' 49", 49
		Barrier,	3' 35", 10

SPECIAL HOURLY DISTANCE.

1st Prize,	$250.	Radley,	25	kilometres	(in 17' 32", 45)
2nd "	100.	McCurdy,	15	"	(in 11' 13", 30)
3rd "	50.	Willard,	5	"	(in 5' 22", 35)

GRAND SPEED—25 KILOMETRES.

Elimination Heat for Monoplanes.

1st	Grahame-White,	14' 56", 13
2nd	Aubrun,	16' 37", 05
	Simon,	16' 54", 80
	Radley,	(5 kilometres in 3' 20", 77) did not finish.

PASSENGER-CARRYING.

Greatest live-weight carried over five kilometres.

1st Prize,	$1,000.	De Lesseps,	356½ lbs.	(in 5' 12", 15)
2nd "	400.	Grahame-White,	326½ lbs.	(in 6' 04", 05)

STATUE OF LIBERTY PRIZE—(About 35 miles.)

Winner,	$10,000.	Moisant,	34' 38", 84
		Grahame White,	35' 21", 30 (fouled pylon 25 at 3.11)
		De Lesseps,	39' 38", 50

CROSS-COUNTRY.

1st Prize,	$500.	Radley,	20' 05", 60
2nd "	250.	Aubrun,	21' 52", 50

GENERAL EVENTS OF THE MEET—(OCTOBER 22nd-30th.)

TOTALIZATION OF DURATION.

1st Prize,	$3,000 and $1,000. Cup.	Hoxsey,	6 hrs. 29' 21", 85
2nd "	1,500.	Latham,	5 hrs. 09' 29", 59
3rd "	1,000.	Grahame-White,	4 hrs. 57' 01", 08
4th "	500.	Johnstone,	4 hrs. 47' 44", 40
		Moisant,	2 hrs. 37' 07", 65
		Aubrun,	1 hr. 48' 04", 90
		Parmelee,	1 hr. 40' 25", 40
		De Lesseps,	1 hr. 34' 39", 85
		Drexel,	1 hr. 22' 48", 00
		McCurdy,	55' 47", 01
		Mars,	31' 15", 10
		Simon,	18' 44", 30
		Radley,	11' 05", 29
		Ely,	8' 20", 81
		Willard,	6' 36", 80
		Leblanc,	5' 37", 50
		Brookins,	5' 30", 85
		Barrier,	3' 35", 10

DECEMBER.

On page 359 Latham's times for 95 kilometres and for 100 kilometres were 5 hrs. 45' 05.66" and 5 hrs. 48' 53.41" respectively, instead of the figures given.

Johnstone,	10' 08", 00	Oct. 24th, during 1st hourly event
Hoxsey,	10' 16", 40	Oct. 24th, during 1st hourly event

GRAND ALTITUDE.

1st Prize,	$2,000.	Johnstone,	8,471 feet	October	27th
2nd "	1,000.	Drexel,	7,105 "	"	24th
3rd "	500.	De Lesseps,	6,931 "	"	25th
4th "	250.	Hoxsey,	6,903 "	"	27th
		Brookins,	4,882 "	"	24th
		Parmelee,	3,819 "	"	28th
		Latham	3,772 "	"	25th
		Simon,	959 "	"	30th
		Barrier,	932 "	"	30th
		Willard,	629 "	"	24th
		Radley,	614 "	"	30th
		Ely,	412 "	"	24th

EXTRA DAY—OCTOBER 31st

AERO CLUB OF AMERICA DISTANCE CONTEST

1st Prize,	$2,000.	Moisant,	135	kilometres	(in 1 hr. 43' 23", 80)
2nd "	1,000.	Latham,	87,5	"	(in 1 hr. 04' 36", 00)
3rd "	500.	Simon,	60	"	(in 50' 13", 00)
		Mars,	2,5	"	(in 2' 21", 80)

SPECIAL "DEMOISELLE" MATCH-RACE.

Seven and one half kilometres.

	Garros	(5 kilometres in 4' 02", 20) did not finish.
1st	Audemars,	6' 05", 20

SPECIAL ALTITUDE PRIZE.

$5,000	Johnstone,	9,714 feet, World's Record	(time up: 1 hr. 29' 21", 60)
	Drexel,	8,373 "	(time up: 1 hr. 15' 32", 80)

MATCH between winners of biplane and monoplane Elimination Heats of Grand Speed Prize—10 kilometres.

1st Prize,	$3,000.	Grahame-White,	14' 34", 40
2nd "	1,000.	McCurdy,	21' 04", 20

MATCH between second men of biplane and monoplane Elimination Heats of Grand Speed Prize—10 kilometres.

Prize,	$500.	Aubrun,	16' 37", 20

Mars reached starting line too late to start.

PRIZE MONEY WON BY AVIATORS.

Grahame-White,	$13,600*
Moisant,	13,550
Johnstone,	9,408 1/3
Latham,	8,183 1/3
Hoxsey,	6,908 1/3
Aubrun,	2,400
De Lesseps,	2,300
Drexel,	1,700
McCurdy,	1,350
Radley,	1,300
Parmelee,	950
Simon,	750
Brookins,	400
Audemars,	100
Willard,	100
Ely,	100
Barrier,	100
Mars,	50
	$63,250.

Hoxsey also won $1,000 Cup: Audemars and Garros, the two "Demoiselle" drivers, received special prizes for their exhibitions and matches.

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* This includes the $5,000 which go to the individual winner, in the Gordon Bennett Cup Race.

Story of the Great Struggle Between Grahame-White and Leblanc for the Gordon Bennett Cup, as Told by the Official Figures.—(Saturday Morning, October 29, 1910)

CLAUDE GRAHAME-WHITE
(Royal Aero Club of the United Kingdom)
100 H. P. Gnôme-Blériot.

Laps	Ki-lom.	Hour of Passing				Time for Lap				Elapsed Time			
		H.	M.	S.	1/100	H.	M.	S.	1/100	H.	M.	S.	1/100
--	--	*8	42	--	--	--	--	--	--	--	--	--	--
--	--	†8	42	39	66	--	--	--	--	--	--	--	--
1	5	8	45	55	30	--	3	15	64	--	3	15	64
2	10	8	49	04	44	--	3	09	14	--	6	24	78
3	15	8	52	12	51	--	3	08	07	--	9	32	85
4	20	8	55	24	62	--	3	12	11	--	12	44	96
5	25	8	58	35	68	--	3	11	06	--	15	56	02
6	30	9	01	39	44	--	3	03	76	--	18	59	78
7	35	9	04	42	52	--	3	03	08	--	22	02	86
8	40	9	07	48	52	--	3	06	00	--	25	08	86
9	45	9	10	56	17	--	3	07	65	--	28	16	51
10	50	9	13	59	14	--	3	02	97	--	31	19	48
11	55	9	17	05	13	--	3	05	99	--	34	25	47
12	60	9	20	04	89	--	2	59	76	--	37	25	23
13	65	9	23	01	23	--	2	56	34	--	40	21	57
14	70	9	25	57	00	--	2	55	77	--	43	17	34
15	75	9	28	54	88	--	2	57	88	--	46	15	22
16	80	9	31	51	60	--	2	56	72	--	49	11	94
17	85	9	34	49	14	--	2	57	54	--	52	09	48
18	90	9	37	47	80	--	2	58	66	--	55	08	14
19	95	9	40	44	04	--	2	56	24	--	58	04	38
20	100	9	43	44	40	--	3	00	36	1	01	04	74
21	105	9	46	43	03	--	2	58	63	1	04	03	37
22	110	9	49	46	13	--	3	03	10	1	07	06	47
‡		9	51	37	22								

ALFRED LEBLANC
(Aéro-Club de France)
100 H. P. Gnôme-Blériot.

Laps	Ki-lom.	Hour of Passing				Time for Lap				Elapsed Time			
		H.	M.	S.	1/100	H.	M.	S.	1/100	H.	M.	S.	1/100
--	--	*8	59	49	20	--	--	--	--	--	--	--	--
--	--	†9	00	20	00	--	--	--	--	--	--	--	--
1	5	9	03	05	63	--	2	45	63	--	2	45	63
2	10	9	05	50	92	--	2	45	29	--	5	30	92
3	15	9	08	37	67	--	2	46	75	--	8	17	67
4	20	9	11	24	96	--	2	47	29	--	11	04	96
5	25	9	14	10	52	--	2	45	56	--	13	50	52
6	30	9	16	58	31	--	2	47	79	--	16	38	31
7	35	9	19	45	20	--	2	46	89	--	19	25	20
8	40	9	22	32	58	--	2	47	38	--	22	12	58
9	45	9	25	21	00	--	2	48	42	--	25	01	00
10	50	9	28	11	02	--	2	50	02	--	27	51	02
11	55	9	30	55	80	--	2	44	78	--	30	35	80
12	60	9	33	42	80	--	2	47	00	--	33	22	80
13	65	9	36	29	32	--	2	46	52	--	36	09	32
14	70	9	39	15	80	--	2	46	48	--	38	55	80
15	75	9	42	01	40	--	2	45	60	--	41	41	40
16	80	9	44	49	50	--	2	48	10	--	44	29	50
17	85	9	47	35	60	--	2	46	10	--	47	15	60
18	90	9	50	24	38	--	2	48	78	--	50	04	38
19	95	9	53	09	70	--	2	45	32	--	52	49	70
§		9	53	35	00								

* Left the ground.
† Crossed starting-line.
‡ Landed in infield.
§ Smashed machine when having to land through lack of gasolene.

Grahame-White, who started at 8:42, broke all existing World's Records from 6 laps inclusive (30 kilometres) to the finish, but a few minutes later Leblanc, who started at 9 o'clock, beat every one of these except, of course, that for the full distance of 100 kilometres.

It will be noticed that Grahame-White continued after the finish for two extra laps; as these last two laps were 23 seconds faster than his first two, he actually flew his last 100 kilometres (from the end of the second lap to the end of the twenty-second) in 1 hour, 41 7/10 seconds—5 minutes, 58 1/10 seconds less than Morane's previous World's Record for the distance.

Leblanc's fastest lap was his eleventh: 2 minutes 44⅘ seconds; this works out at 67.868 miles an hour—the greatest officially-recorded speed at which an aeroplane has ever travelled.

Figured to the nearest tenth of a second Leblanc's best times over the various distances recognized as records, were as follows (Morane's old records are also given for comparison):

Kilometres	Miles	New Records	When made, in race	Previous Records
5	3.107	2' 44 4/5"	11th lap	2' 48⅗"
10	6.214	5' 30 9/10"	first 2 laps	5' 42⅖"
20	12.427	11' 04 4/5"	11th, 12th, 13th and 14th laps	12' 38⅘"
30	18.641	16' 38 3/10"	first 6 laps	19' 32"
40	24.855	22' 12 3/5"	first 8 laps	26' 12"
50	31.068	27' 48 7/10"	last 10 laps	32' 48⅕"
60	37.282	33' 22 4/5"	first 12 laps	39' 32⅖"
70	43.496	38' 55 4/5"	first 14 laps	46' 19⅕"
80	49.710	44' 29 1/2"	first 16 laps	53' 05"
90	55.923	50' 04 1/10"	last 18 laps	59' 52⅗"

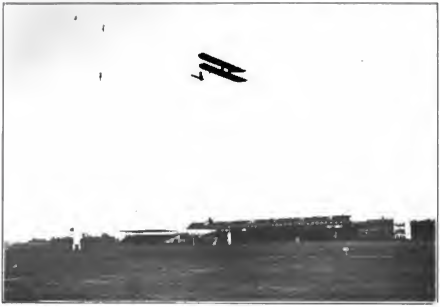
Times of Other Contestants in the Cup Race

		JOHN B. MOISANT (Aero Club of America) 50 H. P. Blériot. Passed starting line at 3:31'35",35 P. M.		ALEC OGILVIE (Royal Aero Club of the United Kingdom) 30 H. P. Wright. Passed starting line at 9:08'53",23 A. M.		HUBERT LATHAM (Aéro-Club de France) 100 H. P. Antoinette. Passed starting line at 10:58'55",67 A. M.		ARMSTRONG J. DREXEL (Aero Club of America) 50 H. P. Blériot. Passed starting line at 3:25'56",53 P. M.	
Laps	Kilom.	Time for Lap	Elapsed Time	Time for Lap	Elapsed Time	Time for Lap	Elapsed Time	Time for Lap	Elapsed Time
1	5	3' 43",35	3' 43",35	3' 31",62	3' 31",62	3' 23",27	3' 23",27	3' 38",15	3' 38",15
2	10	3' 50",55	7' 33",90	3' 34",82	7' 06",44	3' 19",00	6' 42",27	3' 41",47	7' 19",62
3	15	3' 54",40	11' 28",30	3' 30",55	10' 36",99	3' 19",14	10' 01",41	3' 44",15	11' 03",77
4	20	3' 55",59	15' 23",89	3' 27",70	14' 04",69	3' 17",97	13' 19",38	3' 46",03	14' 49",80
5	25	3' 45",00	19' 08",89	3' 29",08	17' 33",77	3' 15",66	16' 35",04	3' 49",39	18' 39",19
6	30	4' 17",98	23' 26",87	3' 26",78	21' 00",55	3' 23",64	19' 58",68	3' 43",58	22' 22",77
7	35	42' 24",16	1h. 05' 51",03	3' 34",22	24' 34",77	3' 20",63	23' 19",31	3' 41",31	26' 04",08
8	40	3' 56",94	1h. 09' 47",97	3' 27",34	28' 02",11	3' 25",74	26' 45",05		
9	45	3' 54",55	1h. 13' 42",52	3' 28",66	31' 30",77	3' 23",28	30' 08",33		
10	50	3' 56",16	1h. 17' 38",68	3' 28",32	34' 59",09	3' 22",82	33' 31",15		
11	55	3' 58",75	1h. 21' 37",43	3' 22",88	38' 21",97	3' 22",27	36' 53",42		
12	60	3' 59",44	1h. 25' 36",87	3' 27",78	41' 49",75	3' 22",83	40' 16",25		
13	65	4' 02",25	1h. 29' 39",12	59' 53",47	1h. 41' 43",22	3' 26",61	43' 42",86		
14	70	4' 00",96	1h. 33' 40",08	3' 30",94	1h. 45' 14",16	3' 24",18	47' 07",04		
15	75	4' 03",33	1h. 37' 43",41	3' 32",53	1h. 48' 46",69	3' 33",83	50' 40",87		
16	80	3' 54",04	1h. 41' 37",45	3' 38",50	1h. 52' 25".19	4h. 43' 43",39	5h. 34' 24",26		
17	85	4' 00",70	1h. 45' 38",15	3' 35",16	1h. 56' 00",35	3' 28",12	5h. 37' 52",38		
18	90	4' 02",32	1h. 49' 40",47	3' 30",11	1h. 59' 30",46	3' 48",60	5h. 41' 40",98		
19	95	4' 04",67	1h. 53' 45",14	3' 32",83	2h. 03' 03",29	3' 24",68	5h. 47' 53",41		
20	100	3' 59",71	1h. 57' 44",85	3' 33",40	2h. 06' 36",69	3' 47",75	6h. 45' 28",73		
Extra				3' 34",74		4' 53",27			

According to the rules of the race, the starting-line had to be crossed prior to 3:32 P. M.; J. Radley (Royal Aero Club of the United Kingdom), 50 H. P. Blériot, crossed at 3:32'25",36, and Chas. K. Hamilton (Aero Club of America), 110 H. P. Hamilton biplane, at 3:36'26",06: they were accordingly disqualified and called upon to land.

The speeds per hour of any individual laps can be obtained by referring to the tables published in the November AIRCRAFT.—*G. F. C. W.*

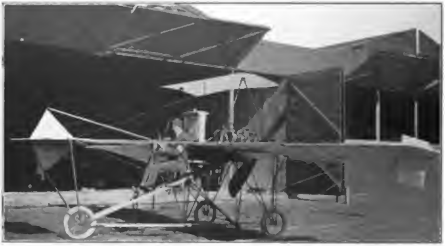
WITH THE CAMERA MAN AT BELMONT PARK



JOHNSTONE IN A WRIGHT MACHINE BEGINNING ONE OF HIS MANY ALTITUDE FLIGHTS.

CHAS. K. HAMILTON AND HUBERT LATHAM THE GREAT AMERICAN AND EUROPEAN AEROPLANE DRIVERS.

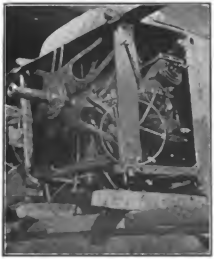
HORACE WILD, J. C. MARS, MRS. MARS AND MRS. ELY.



EUGENE ELY AT THE WHEEL OF THE NEW CURTISS SINGLE PLANE MACHINE.

THE WRECK OF BROOKINS' BIPLANE BEING REMOVED FROM THE COURSE. FIGURES ON BOARD SHOW POSITION OF FLIERS IN GORDON BENNETT CUP RACE THEN IN PROGRESS

THREE AERONAUTIC AUTHORITIES: WILBUR WRIGHT ISRAEL LUDLOW, ORVILLE WRIGHT.



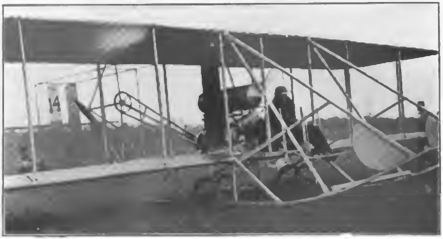
THE MOTOR WHICH BROKE THE WORLD'S SPEED RECORD.—LEBLANC'S FOURTEEN CYLINDER 100 HORSE POWER GNÔME IS HERE SHOWN, AFTER IT HAD CUT IN TWO A TELEGRAPH POLE WHICH IT STRUCK AT 72 MILES AN HOUR, WHEN ON THE LAST LAP OF THE GORDON BENNETT CUP RACE.

TURPIN, TAYLOR, ORVILLE WRIGHT, WILBUR WRIGHT, BROOKINS AND JOHNSTONE DISCUSSING THE MERITS OF THE WRIGHT "ROADSTER."

ALFRED W. LAWSON, F. L. YOUNG, CHAS. K. HAMILTON, GLENN H. CURTISS, J. A. D. MC CURDY AND RICHARD YOUNG.

MISS KATHERINE WRIGHT, PIERRE GASNIER, OF THE AERO CLUB OF FRANCE, AND HUBERT LATHAM

THE HAMILTONIAN BIPLANE.



ARCH. HOXSEY ABOUT TO START FOR ALTITUDE ON A REGULAR HEADLESS WRIGHT.

THE INTERNATIONAL AVIATION MEET—General Details of Machines

MONOPLANES

PILOT	Make of Flyer	Length Over All	Breadth Over All	Supporting Surface in Sq. Ft.	WINGS		RUDDERS		TAIL	Lateral Stability	Landing Chassis	MOTOR				PROPELLER			
					Spread	Chord	Vertical	Horizontal	Fixed Horizontal Surface			Make	H. P.	Cooling	Ignition	Make	Blades	Diameter	R. P. M.
Alfred Leblanc (France)	Blériot (100 Gnôme)	23'	26'	150 (Approx.)	12' 6" (each)	6' 6"	2' 11" x 3'	38" x 35"	6' x 30"	Warping	2 castor wheels and skid	Gnôme 14 cylinders	100	Air	Bosch	Régy Frères	2	7' 11"	1300
Alfred Leblanc (Sold to Moisant)	Blériot (XI Bis.)	23'	28'	160 (Approx.)	13' 6" (each)	6' 6"	2' 11" x 3'	38" x 35"	6' x 35"	Warping	2 castor wheels and skid	Gnôme 7 cylinders	50	Air	Bosch	Chauvière	2	7' 6"	1200
John B. Moisant (America)	Blériot (Two-seater)	22'	32'	210 (Approx.)	15' (each)	7'	Oval Shape	Two semi-circular flaps	Flat triangular tail	Warping	2 castor wheels	Gnôme 7 cylinders	50	Air	Bosch	Chauvière	2	7' 6"	1200
John B. Moisant (America)	Blériot (XI Bis.)	23'	28'	160 (Approx.)	13' 6" (each)	6' 6"	2' 11" x 3'	38" x 35"	6' x 35"	Warping	2 castor wheels and skid	Gnôme 7 cylinders	50	Air	Bosch	Chauvière	2	7' 6"	1200
J. A. Drexel (America)	Blériot (XI Bis.)	23'	28'	160 (Approx.)	13' 6" (each)	6' 6"	2' 11" x 3'	38" x 35"	6' x 35"	Warping	3 castor wheels	Gnôme 7 cylinders	50	Air	Bosch	Chauvière	2	7' 6"	1200
James Radley (England)	Blériot (XI Bis.)	23'	28'	160 (Approx.)	13' 6" (each)	6' 6"	2' 11" x 3'	38" x 35"	6' x 35"	Warping	2 castor wheels and skid	Gnôme 7 cylinders	50	Air	Bosch	Chauvière	2	7' 6"	1200
Claude Grahame-White (England)	Blériot (100 Gnôme)	23'	26'	150 (Approx.)	12' 6" (each)	6' 6"	2' 11" x 3'	38" x 35"	6' x 35"	Warping	2 castor wheels and skid	Gnôme 14 cylinders	100	Air	Bosch	Chauvière	2	7' 11"	1300
Claude Grahame-White (England)	Blériot (XI Bis.)	23'	28'	160 (Approx.)	13' 6" (each)	6' 6"	2' 11" x 3'	38" x 35"	6' x 35"	Warping	2 castor wheels and skid	Gnôme 7 cylinders	50	Air	Bosch	Chauvière	2	7' 11"	1200
W. E. McArdle (England)	Blériot (XI Bis.)	23'	28'	160 (Approx.)	13' 6" (each)	6' 6"	2' 11" x 3'	38" x 35"	6' x 30"	Warping	3 castor wheels	Gnôme 7 cylinders	50	Air	Bosch	Chauvière	2	7' 6"	1200
Réné Barrier (France)	Blériot (XI Bis.)	23'	28'	160 (Approx.)	13' 6" (each)	6' 6"	2' 11" x 3'	38" x 35"	6' x 35"	Warping	2 castor wheels and skid	Gnôme 7 cylinders	50	Air	Bosch	Chauvière	2	7' 6"	1200
Réné Simon (France)	Blériot (XI Bis.)	23'	28'	160 (Approx.)	13' 6" (each)	6' 6"	2' 11" x 3'	38" x 35"	6' x 35"	Warping	2 castor wheels and skid	Gnôme 7 cylinders	50	Air	Bosch	Chauvière	2	7' 6"	1200
Emile Aubrun (France)	Blériot (XI Bis.)	23'	28'	160 (Approx.)	13' 6" (each)	6' 6"	2' 11" x 3'	38" x 35"	6' x 30"	Warping	2 castor wheels and skid	Gnôme 7 cylinders	50	Air	Bosch	Chauvière	2	7' 6"	1200
Roland Garros (France)	Santos-Dumont "Demoiselle"	20'	18'	100 (Approx.)	18'	6' 6"	Combination vertical and horizontal rudder		None	Warping	2 wheels and skid	Clément-Bayard 2 cylinders	30	Water	Bosch	Chauvière	2	6' 6"	1100
E. Audemars (Switzerland)	Clément-Bayard "Demoiselle"	20'	18'	100 (Approx.)	18'	6' 6"	Combination vertical and horizontal rudder		None	Warping	2 wheels	Clément-Bayard 2 cylinders	30	Water	Bosch	Chauvière	2	6' 6"	1100
Comte Jacques de Lesseps (France)	Blériot (Two-seater)	22'	32'	210 (Approx.)	15' (each)	7'	Oval Shape	Two semi-circular flaps	Flat triangular tail	Warping	3 castor wheels	Gnôme 7 cylinders	50	Air	Bosch	Chauvière	2	7' 6"	1200
Comte Jacques de Lesseps (France)	Blériot (XI Bis.)	23'	28'	160 (Approx.)	13' 6" (each)	6' 6"	2' 11" x 3'	38" x 35"	6' x 35"	Warping	2 castor wheels and skid	Gnôme 7 cylinders	50	Air	Bosch	Chauvière	2	7' 6"	1200
Hubert Latham (France)	Antoinette Racer	42'	40'		19' (each)	8' 6" to 7'	Two triangular rudders	One triangular rudder	Large triangular surface	Warping	2 wheels and skid	Antoinette 16 cylinders	100	Water	Bosch	Normale	2	7' 11"	1300
Hubert Latham (France)	Antoinette (50 H. P.)	42'	46'	377	22' (each)	8' 6" to 6' 6"	Two triangular rudders	One triangular rudder	Large triangular surface	Warping	2 wheels and skid	Antoinette 8 cylinders	50	Water	Bosch	Normale	2	7' 11"	1300

MONOPLANES—Continued

Harry S. Harkness (America)	Antoinette (Two-seater)	42'	46'	377	22' (each)	8' 6" to 6' 6"	Two triangular rudders	One triangular rudder	Large triangular surface	Warping	2 wheels and skid	Emerson 6 cylinders	50	Water	Bosch	Antoinette (metal)	2	7' 6"	1200
Harry S. Harkness (America)	Antoinette (Single Seater)	42'	46'	377	22' (each)	8' 6" to 6' 6"	Two triangular rudders	One triangular rudder	Large triangular surface	Warping	2 wheels and skid	Antoinette 8 cylinders	50	Water	Bosch	Antoinette (metal)	2	7' 6"	1200
Glen H. Curtiss (America)	Curtiss (Single Surface)	25'	26'	130	26'	5'	4' x 3'	8' x 1' (flap)	8' x 1' 6" (fixed)	Ailerons	3 wheels	Curtiss 8 cylinders	60	Water	Bosch	Paragon	2	7'	1200

BIPLANES

Chas. F. Willard (America)	Curtiss Special	34'	32'	300	32'	5'	3' 4" x 2' 8"	7' x 30" (Biplane)	7' x 27"	Ailerons	3 wheels	Curtiss 8 cylinders	60	Water	Bosch	Curtiss	2	7'	1200
Eugene Ely (America)	Curtiss	28'	26'	263	26'	4' 6"	3' x 2' 4"	6' x 2' (Biplane)	6' x 25"	Ailerons	3 wheels	Curtiss 8 cylinders	60	Water	Bosch	Curtiss	2	7' 6"	1250
J. C. Mars (America)	Curtiss	28'	26'	263	26'	4' 6"	3' x 2' 4"	6' x 2' (Biplane)	6' x 25"	Ailerons	3 wheels	Curtiss 8 cylinders	60	Water	Bosch	Curtiss	2	7' 6"	1250
J. A. D. McCurdy (America)	Curtiss	26'	26'	263	26'	4' 6"	3' x 2' 4"	6' x 2' (Biplane)	6' x 25"	Ailerons	3 wheels	Curtiss 8 cylinders	60	Water	Bosch	Curtiss	2	7' 6"	1250
J. F. Frisbie (America)	Frisbie (Curtiss Type)	28'	26'	263	26'	4' 0"	3' x 2' 4"	6' x 2' (Biplane)	6' x 25"	Ailerons	3 wheels	Hall-Scott 8 cylinders	60	Water	Bosch	Hall	2	8'	1100
Chas. K. Hamilton (America)	Hamiltonian	30'	31'	310	31'	6'	4' x 3'	7' x 26" (Biplane)	7' x 30"	Ailerons	3 wheels	Hamiltonian 8 cylinders	110	Water	Bosch	Charavay	2	7' 11"	1100
Chas. K. Hamilton (America)	Hamiltonian	28'	28'	263	26'	4' 6"	3' x 2' 4"	6' x 2' (Biplane)	6' x 25"	Ailerons	3 wheels	Hamiltonian 8 cylinders	60	Water	Bosch	Charavay	2	6'	1100
Claude Grahame-White (England)	Farman	38'	33'	429	33'	6' 6"	Two	6' x 2' 6" and flap	Biplane	Ailerons	Wheels and skids	Gnôme 7 cylinders	50	Air	Bosch	Chauvière	2	8'	1200
Clifford B. Harmon (America)	Farman (Modified)	33'	33'	429	33'	6' 0"	Two	6' x 2' 6" and flap	Biplane	Ailerons	Wheels and skids	Gnôme 7 cylinders	60	Air	Bosch	Requa-Gibson	2	8'	1200
Walter Brookins (America)	Wright Racer	19' 6"	21' 6"	146	21' 6"	3' 6"	Twin vertical rudder	8' x 2'	None	Warping	Wheels and skids	Wright 8 cylinders	60	Water	Mea	Wright (two)	2	8' 6"	500
Ralph Johnstone (America)	Wright		39'	485	39'	6' 2"	Twin vertical rudder	12' x 30"	None	Warping	Wheels and skids	Wright 4 cylinders	30	Water	Mea	Wright (two)	2	8' 6"	450
Arch. Hoxsey (America)	Wright		39'	485	39'	6' 6"	Twin vertical rudder	12' x 30"	None	Warping	Wheels and skids	Wright 4 cylinders	30	Water	Mea	Wright (two)	2	8' 6"	450
Ralph Johnstone (America)	Wright High Flyer	19' 6"	26'	180	26'	3' 6"	Twin vertical rudder	8' x 2'	None	Warping	Wheels and skids	Wright 4 cylinders	30	Water	Mea	Wright (two)	2	8' 6"	450
Alec Ogilvie (England)	Wright Roadster	19' 6"	22'	180	22'	3' 6"	Twin vertical rudder	8' x 2'	None	Warping	Wheels and skids	Wright 4 cylinders	30	Water	Mea	Wright (two)	2	8' 6"	450
P. O. Parmelee (America)	Wright		39'	485	39'	6' 6"	Twin vertical rudder	12' x 30"	None	Warping	Wheels and skids	Wright 4 cylinders	30	Water	Mea	Wright (two)	2	8' 6"	450
Tod Shriver (America)	Shriver (Curtiss Type)	30'	31'	310	31'	5'	4' x 3 (Approx.)	7' x 3' (single)	7' x 30"	Ailerons	3 wheels and skid	Kirkham 6 cylinders	40	Water	Bosch	Charavay	2	7'	1200

THE GORDON BENNETT BALLOON CUP RACE

SAMUEL PERKINS. ALLAN R. HAWLEY. AUGUSTUS POST.

The Start of the Great International Balloon Race from St. Louis on October 17th. Won by the "America II" manned by Allan R. Hawley and Augustus Post. The Cup thus remains in America for another year. A new World's Distance Record was established, supplanting that of the Comte de la Vaulx (1193½ Miles) which had withstood all assaults for ten years.

Balloon.	Manned by	Time of Start	Landed at	Time of Landing	Approximate Distance	Time Hours	Min.
America II (United States)	A. R. Hawley, Pilot. Augustus Post, Aide.	Oct. 17, 5:46:20 P. M.	Lake Tschotogama, near Peribonka, Quebec.	Oct. 19, 3:30 P. M.	1,225 Miles	45	44
Dusseldorf (Germany)	Lieut. Hans Gericke, Pilot. Samuel F. Perkins, Aide.	Oct. 17, 5:35:55 P. M.	Kiskisink, Quebec.	Oct. 19, 12 M.	1,150 Miles	42	24
Germania (Germany)	Hugo von Abercron, Pilot. August Blanckertz, Aide.	Oct. 17, 5:53:50 P. M.	Coocoocahe, Quebec.	Oct. 19, 10 A. M.	1,100 Miles	40	6
Helvetia (Switzerland)	Colonel Schaeck, Pilot. A. Armbruster, Aide.	Oct. 17, 5:26:55 P. M.	Ville Marie, Quebec.	Oct. 19, 6 A. M.	850 Miles	36	33
Harburg III (Germany)	Leopold Vogt, Pilot. W. F. Assmann, Aide.	Oct. 17, 5:14:15 P. M.	Gull Island, Lake Nepissing, Ontario.	Oct. 18, 9 P. M.	795 Miles	27	46
Azurea (Switzerland)	Capt. E. Messner, Pilot. Léon Givandan, Aide.	Oct. 17, 5:07:05 P. M.	22 miles N. E. Biscotasing, Ontario	Oct. 19, 8 A. M.	772 Miles	38	53
Isle de France (France)	Alfred Leblanc, Pilot. Walter de Mumm, Aide.	Oct. 17, 5:23:30 P. M.	3 miles north Pogamasing, Ontario.	Oct. 19, 4:23 A. M.	725 Miles	35	
St. Louis IV (United States)	Capt. H. E. Honeywell, Pilot. J. W. Solland, Aide.	Oct. 17, 5:25:40 P. M.	Hillman, Michigan.	Oct. 18, 10 P. M.	570 Miles	28	34
Condor (France)	Jacques Faure, Pilot. Ernest G. Schmolck, Aide.	Oct. 17, 4:20:45 P. M.	4 miles north Two Rivers, Wis.	Oct. 18, 12:45 P. M.	415 Miles	20	24
Million Population Club (United States)	S. Louis von Phul, Pilot. J. M. O'Reilly, Aide.	Oct. 17, 4:52:45 P. M.	6½ miles north Racine, Wis.	Oct. 18, 7:25 A. M.	322½ Miles	14	32

FEATURES OF THE PARIS SHOW

From "The Aero," London

The Second Annual Parisian Aero-Show opened on October 15th; all the better known makes of planes, motors and accessories were represented besides many newcomers; we append a summary of the main features of the more important exhibits.

HENRY FARMAN.

The Henry Farman is little altered in outward appearance from the type already well known, but there are important detail alterations. The single machine shown is the first example of what is known in the automobile business as "show finish." All the steel parts are plated, the aluminum parts polished, and the woodwork carefully varnished. This is merely mentioned as a sign of the times, showing that the trade has now reached the stage of being a standard industry. In this particular machine a pair of tiny wheels is fitted close to the tip of each skid, with the idea of preventing the points of the skids from digging in if a landing be made on rolling ground, or if a small bank be encountered. A real alteration, however, is the folding wing tip. The lower plane is shorter than the upper, as in the "Paulhan" or "racing" type, and the extended portions of the upper plane, which carry the ailerons, are hinged to the main spars, so that they fold down and reduce the spread of the machine for housing purposes. To simplify the operation, the stay wires are done away with and the extension surface is held down to the lower plane by a couple of steel tubes bolted to the main spars of the lower plane. The length of these is adjustable by means of a simple internal screw arrangement. Another alteration is in the planes themselves, which have now double surfaces and a blunt entering edge, though the ribs are very shallow and the surfaces practically touch in the middle. The control has also been altered materially, the old single tube being articulated at the universal joint so that the lower portion never moves laterally, the aileron control being attached, as hitherto, to the upper part, which now moves in a "sector" mounted as a fixture on the lower part.

MAURICE FARMAN.

The Maurice Farman is also little altered outwardly from the regular type. The greatest care is shown in the details of the machine. Wherever the front struts of the skids cross, as they do in four places, the joints are bound with fabric and strengthened by flitch-plates. There is now a flap on the back of the upper tail plane, which is coupled to the front elevator. The control, as hitherto, is by a wheel on the horizontal shaft, sliding fore and aft for elevation control and turning right and left for lateral control. The pilot sits in a properly cased hull, which must not only lessen head resistance but give much needed shelter. A good deal of attention was attracted to the stand by the fact that Naval Lieutenant Byasson flew from Vincennes to the camp at Chalons on one of these machines on the Tuesday after the show opened, and arrived safely without landing *en route*, in spite of wind and fog. The cased hull must have been of considerable service on this occasion. He, like other

Maurice Farman pilots, used an air-cooled Renault motor.

LOUIS PAULHAN.

There is no disputing the fact that the Paulhan *machine à voler* is the most original in the whole show. As may be seen from the sketch, it is not in the least like any machine anyone else has yet produced, and except that it has two planes one above the other, and an elevator, a tail, and a rudder, it hardly bears any resemblance to one's hitherto conceived ideas of a flying machine. Even in its details it departs absolutely from standard practice. For example, the elevator, instead of working on any kind of metal joint, is slung on leather straps, and it works by the bending of these straps. The long skids are linked up to the point of the main frame members by an intermediate strut of wood, and this also is attached by leather straps at each end. The tail also is attached by leather, and even the struts from the skids to the main frame are held solely by leather. Evidently M. Paulhan believes, with the traditional shoemaker, that there is "nothing like leather," and perhaps he is right. The main beams of the frame, and the wooden structure which does duty for the main spars of the planes, elevator, rudder, and tail are, made up of a series of endless W's. They are composed of two long flat planks, separated by short struts of the same width as the plank, and held in position by angle plates and copper rivets. Instead of warping the wings or using ailerons, the whole angle of incidence of the wings is altered. M. Paulhan claims that the W method of construction is lighter and stronger than any other, and that the passage of the air through the interstices makes for lateral stability, which seems probable, taking Dr. Grahame Bell's tetrahedral kites as an example, though it remains to be seen whether the extra head resistance is balanced by the advantages. The surfaces themselves are simply hooked on to the spars and supported rearward by flexible ribs, which fit into pockets in the fabric, the idea being to give a flexible edge—an idea which has been proved sound by experiment. This system is the patent of M. Fabre, of Marseilles, with whom Paulhan has been collaborating. In the event of any of these ribs being broken they can be easily replaced. The whole machine is full of novel points, even to the method of attaching the stay-wires. The machine is said to have flown quite satisfactorily, even in its experimental stage, and if it does not perform well in future it will not be for lack of thought and experience on the part of its designers and its pilot.

THE NIEUPORT MONOPLANE.

One of the most interesting machines in the show is the Nieuport, a machine which is notable for the fact that it has been officially timed to fly at a speed of 50 m.p.h. with a simple two-cylinder horizontal engine of 18 h. p. This efficiency has evidently been reached simply by cutting down head resistence and weight to a minimum, and, indeed, it is hard to see how it could be further reduced. The whole hull, or fuselage, is boxed in, and is built in the shape most calculated to give correct streamline form. The only possible objection to it is that the section of the body is square instead of circular. The landing arrangement contains a central skid mounted on the apexes of two inverted A's, one of which connects to the engine-bearers and the other with the lowest point of the fuselage. The wheels are simply mounted on the ends of a traverse laminated spring fixed under the forward A struts. The engine-bearers are themselves merely extensions of the main fuselage members, strengthened with flitch-plates and terminating in metal clamps which hold the cylinders. The pilot sits right inside the hull, and is protected up to the eyes by a shield built over the front of the fuselage. The empennage and tail arrangement is much like that of the R.E.P., except that there are no fixed vertical fins, but only a single rudder. To reduce head resistance still further the wings are held by two wires only, the front wire being a fixture, and the rear one working the warping.

THE ESNAULT-PELTERIE.

The R.E.P. is obviously a much-improved machine since last year, though at first glance very similar in general appearance, the most recent type being considerably longer in the fuselage, and the landing chassis has been vastly improved; also, the wings have a distinct dihedral angle. Where formerly a single wheel took the whole landing shock there are now two sprung wheels, one on each side of an enormous skid, which is itself coupled to the front of the fuselage by telescoping tubes held up to their work by a spiral spring. The rear of the skid is hinged direct to the bottom of the fuselage. The axles of the two wheels are hinged to the big central skid at their inner ends, and the outer ends are carried by tubes which are coupled to the sides of the fuselage, and held up by rubber tension springs. This is, of course, an elaboration of the Nieuport and Handley-Page principle, but it is splendidly carried out, and gives an impression of immense strength. The engine fitted to the show machine is also a great improvement on that turned out last year, and it has proved its ability during the past few months under severe tests. So far as the system of control is concerned, this remains in principle the same as in the original machine designed by M. Robert Esnault-Pelterie.

FERNAND LIORE.

The Lioré monoplane is practically the development of the Witzig-Lioré-Dutilleul of last year; as a matter of fact it is the same machine with minor modifications. It is one of the few machines with twin tractor screws, a system which has many theoretical advantages, but has hitherto not been very successful in practice. In this case the propellers are chain driven, one of them being reversed by means of a plain gear on the engine-shaft. L. E. propellers of alterable pitch are used, these propellers having two advantages, that of allowing of variation of pitch for experimental purposes, though except in one position the blade form must necessarily be wrong, and that of allowing an easy renewal of a broken blade. The butt of the blade is round and is clamped into position with rubber packing between the clamp and the wood.

A 30-40 Grégoire engine is used, fitted with a clutch and started by a handle. As shown in the sketch, the radiator is curved downwards, and may to an extent act as a shield for the pilot; on the other hand, it may also tend to push the nose of the machine downwards and detract from the lift. The construction of the machine itself calls for little remark beyond the fact that the mast for the stay-wires is of steel tubing drilled out till it resembles lace-work thus increasing head resistance and saving hardly any weight. The elevator is a single flap at the rear of a large horizontal empennage. There is also a vertical empennage, behind which is the rudder. The ailerons are merely extended portions of the main wings, and all three controls are worked from the wheel.

TURCAT-MERY AND ROUGIER.

This is a highly original and interesting machine, built for the big engineering firm, under the auspices of Henry Rougier. Its peculiarly shaped planes are the specialty of M. Odier, whose first machine was very satisfactory in its trials. M. Rougier will be the pilot of M. Odier's latest product, and he has already made some successful flights on it. He told the writer that the machine was extremely fast, as it should be from its design.

The machine is a biplane, but, as may be seen, the main spars are curved, so giving the appearance of four independent wings. Only two pairs of uprights are used, the front ones being continued downward to carry two curiously shaped skids, which hinge on the foot of each upright and have each a single wheel trailing behind the centre. A heavy tension spring holds the nose of each skid up to the front edge of the plane, so that when the wheels give under the shock of landing they pull the skid down against the pull of the spring. As the hinge is also a swivel, the wheels can trail at any angle, and so allow the machine to swing when on the ground.

The main frame of the machine is built of two enormous wooden section girders, and is connected to the planes by bowed vertical members, the forward pair of which carries the E.N.V engine so that the propeller-shaft is above the lower plane by about one-third of the distance between the planes. The propeller shown is a four-bladed one, placed in front of the planes. The pilot sits some distance behind the planes, and should have a fairly clear view below and in front of him. Below the pilot's seat is a swivelling skid, and there is another under the tail so that there should be ample protection against landing shocks.

The whole monoplane tail is movable, and acts as an elevator. It is operated by a stout steel tube, connecting with the upright tube, to which the steering wheel is fixed, the wheel having its axle horizontal. Turning the wheel on its axle controls the ailerons, which are fixed to the upper plane only. The small twin rudders are worked by the feet. Forward of the elevator there is a small fixed vertical stabilising fin. The central skid, under the pilot's seat is connected by wires to a little hand winch, so that it can be pulled well off the ground to be out of the way when starting. Then by releasing a ratchet it springs down and acts as a brake on landing. The whole machine is very original, and gives a distinctly favorable impression.

AUDINEAU AND CO.

This monoplane is made by the same firm who have invented the "Fréno-Liège" system of wing-building. In these wings solid cork distance pieces are used between the ribs, with the result that very great flexibility is achieved without, apparently, weakening the wing in the least, and as the distance pieces themselves take up the twist there is consequently far less strain on the ribs and spars themselves. Further, owing to the resilient quality of the cork, a wing constructed in this way should stand much greater actual shock in the event of a wing-tip striking the ground on landing.

The machine itself has a purely fusiform body, similar to that of the Humber built to the design of the late M. Le Blon. The whole front of the machine, including the Lemale engine, is cased in aluminium sheeting, but the rear seven-eighths of the length is merely fabric-covered. Nevertheless, that stream-line effect should be practically the same.

The landing chassis is connected to the fuselage itself much in the ordinary way, but there are two stout skids running from the underside of the fuselage well out in front of the propeller. The wheels are carried on tubular forks swivelling on the ends of tubular uprights, the leading edge being held up by tension springs. Under the tail, which is of the bisected non-lifting type, and is preceded by a long empennage, there is a swivelling skid. Between the sections of the tail is a crescent-shaped rudder pivoted so that the horns of the crescent are pulled over to the opposite side of the centre line of the fuselage to the main body of the surface. Though not actually flown, the machine gives quite a good impression.

GOUPY.

The Goupy biplane is really rather what one would expect if M. Blériot cared to build a biplane. The chassis and fuselage are practically pure Blériot, except that two neat little skids are fitted on an extension of the tubular chassis posts. The tail also is Blériot, the upper plane being fixed, and the lower one having Blériot type elevators. The distinguishing feature of the machine, however, is the position of the planes, the upper ones being considerably in advance of the lower ones, which is wrong in theory, though in practice it works quite well, and it is claimed that this position gives stability in a *vol plané*. Another distinctive feature is the ailerons, which are little flat planes pivoting on extensions of the front main spars. This also is wrong in theory, but seems to work in practice, as is proved by the fact that M. Ladougne on his Goupy did more flying than any other of the troupe of French aviators recently performing in England.

The rudder is fixed behind the lower tail plane, and the control is by a variation of the Blériot *cloche*. To MM. Goupy and Ladougne belong the credit of producing the first really satisfactory biplane to fly with the engine in front and no elevator.

REGY FRERES.

A strikingly handsome monoplane is shown by Régy frères. This machine is ticketed as built for the Rossel-Peugeot firm, for them to test their new rotary engines on, and it looks every inch a flier. The general lines of the hull recall the Hanriot, but the chassis is much simplified. It is of the now popular single-skid type, the point of the skid carrying a single small wheel to help it over bumps.

Under the centre of the hull, right under the wings, is a big steel tube, as in the Antoinette, and inside this telescopes another big tube, carrying at its end a stout tubular axle with a wheel at each end. From the ends of the axle run struts to a sliding collar on the main tube, this collar being held down by rubber tension springs, which take the first landing shocks. The axle is free to twist its fixed tube inside the outer telescope, but it is held at right angles to the centre line of the machine by wire stays to the bow of the hull, terminating in rubber springs. Thus the wheels are free to move in almost any direction, but always return to their true position. The makers will probably find it necessary in practice to allow each half of the axle to move radially from its junction with the inner telescope tube as well, for no provision at present exists for this.

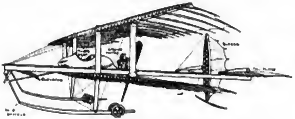
The wings are of an Hanriot-cum-Antoinette type, and the rear controls consist of a bisected elevator behind a triangular empennage, and an almost circular rudder with one quarter cut out, so that half the circle is behind the rudder post and one quarter in front of it and over the top of the empennage. Below the horizontal empennage is a vertical empennage with its lower edge fixed to the tail skid. The control is by an ordinary Blériot type *cloche* and foot lever.

THE COMPAGNIE AERIENNE.

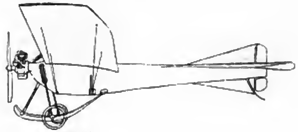
Certainly one of the most improved machines in the show is the Voisin, for which the Campagnie Aérienne are the agents. The machine is now built entirely of steel tube with the exception of the fuselage and the ribs of the planes. As has already been noted, the front elevator has now been abolished, and the longitudinal control is got by a large flap at the rear of the tail plane, of which there is now only one. The tail booms are of steel tube about 1¼in. diameter and are made in three lengths, which can be dismounted for packing. The outer section of the main planes are also dismountable, so that the whole machine will go into a case 14 cubic metres capacity. The springing arrangement has also been materially altered, with the result that the wheels are brought much further forward, thus avoiding the tendency these machines formerly had to stand on their heads as soon as they touched the ground.

As a further safeguard a single wheel is fitted at the very front of the fuselage to take the

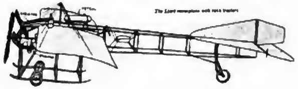
LATEST TYPES OF FRENCH AIR-CRAFT



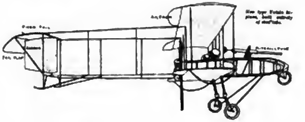
General design of the new Paulhan machine



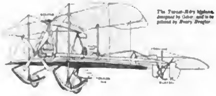
The latest R.E.P.



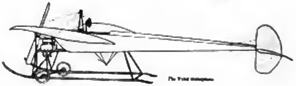
The Lioré monoplane with twin tractors



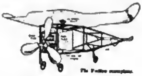
New type Voisin biplane, built entirely of steel tube.



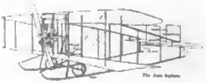
The Turcat-Méry biplane, designed by Colliex and to be piloted by Henry Brégi



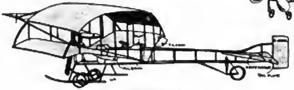
The Train monoplane.



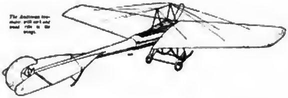
The Pischof monoplane.



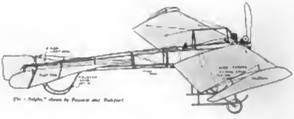
The [illegible] biplane



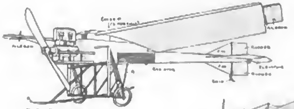
The Sloan "[illegible]."



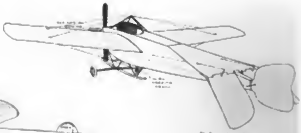
The Antoinette two-seater with cork and wood ribs to the wings.



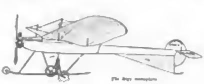
The "Dolphin," shown by Pascaud and Deckfort



The Pujo Koechlin two-motor monoplane



The Bouquet monoplane



The Bagy monoplane

TAKEN FROM DRAWINGS OF "THE AERO," LONDON.

shock and prevent "digging in" if the machine should tip up. The fuselage projects well forward, the pilot's seat being just in front of the edge of the main planes. From the front of the fuselage two hinged tubes run to the main axle of the landing chassis and act as radius rods, the weight of the machine being taken on coil springs holding down telescoping tubes. These springs are also fitted with rubber buffers. At the wing tips there are wooden bows as a protection against side rolls on the ground.

The firm still sticks to its metal propellers, and, judging from the Paris to Bordeaux flight of Bielovuccic and Brégi's recent flights, they cannot be so inefficient in practice as in theory. Passengers on the Voisin have hitherto been carried behind the pilot, but the show machine has a wide fuselage, in which the passenger sits, alongside the pilot, and, to give an air of artistic verisimilitude, a machine gun has been fitted alongside the passenger, as shown in the illustration, though it strikes one that, as the bore of this gun is about that of a pom-pom, the recoil might lead to trouble in the fuselage joints, apart from any effect it might have on the control of the machine.

The tail frame when on the ground rests on strap-steel skids, which are not sprung in any way and might allow of some damage to the rear framework in a landing on rough ground. The steering wheel controls the rear elevator-flap and the rudder, the ailerons being worked by the feet. It is, of course, a matter of taste how this is arranged, but prevailing opinion seems to point to foot control of the rudder and manual control of the ailerons as being quicker and more natural.

AVIA.

The Avia firm shows a monoplane with a five-cylinder engine. The machine is practically of Blériot type, but has compression springs to the chassis instead of rubber in tension, and it has a non-lifting tail elevator, preceded by an empennage and topped by a vertical empennage and rudder. Under the tail is a cane skid of the new Blériot type.

LOUIS BREGUET.

The Bréguet biplane is one of those machines—one knows people like it, too—at which everyone laughs, and yet everyone admires. At Rheims, where it flew really well and terrifically fast, Frants Reichel christened it the "Flying Coffee Pot," and every time it came a cropper, as it did fairly often, everyone roared with laughter, with all the clearer conscience, because nothing ever seemed to break, and the pilots never got hurt. The machine is constructed very largely of steel tubing, and as there are only four uprights in the whole machine—two close to the centre and one halfway to the end of each plane—head resistance has been reduced to a minimum. To the two centre uprights are fixed the fuselage, a foot above the lower planes. The front of the fuselage is stayed by two steel tubes from the lower plane to support the engine, and on a level with the engine are two bowsprits from which run wire stays to hold the planes forward against head resistance.

The chassis is a somewhat complicated affair consisting of three wheels, guarded by skids, and all mounted on big steel tubes. The tail-elevator and rudder are a huge cruciform affair at the end of a long thin fuselage, in which the pilot sits well aft, so that he has a practically clear view in any direction. Control is by the now popular method of a vertical post, to the top of which a wheel is fixed with its axle horizontal. Swinging the post warps the rear edge of the upper plane. Twisting the wheel operates the rudder in conjunction with the front wheel, and moving the post fore and aft works the elevator. The whole machine, though it looks clumsy, with its big tubes, after the "cobweb" effects to which one is accustomed, is really very light, and is certainly simple and efficient.

CAMPAGNIE INTERNATIONALE DE NAVIGATION AERIENNE.

This firm, known as the C.I.N.A., shows two decidedly interesting machines, the Thomann monoplane and the Safa biplane.

The Thomann is known as the Métallique, being built entirely of steel tubing. Its general lines are somewhat conventional, the chassis being on Blériot lines, but with coil springs instead of rubber shock absorbers. By carrying the connecting link from the top collar inside the coils to the bottom of the spring, the spring is actually in compression, though the effect is that of a tension spring without its disadvantages. That the machine is a practical proposition is proved by the fact that the first machine built by M. Thomann is flying every day at Issy-les-Moulineaux in the hands of an absolute novice, M. Gallier, who received his first lesson on this same machine, and has not smashed it, in spite of several bad falls and crooked landings.

Apart from its metallic construction, the chief feature of the machine is the dismountable fuselage, which is constructed in three lengths, and so the whole machine can be packed in a space no longer or higher than the wings and no wider than the chassis. For the use of learners only a small wheel is bolted to the frame, so that it projects just in front of the propeller and protects it in case of the machine tipping forward. The semi-circular tail-elevator is of the non-lifting type, preceded by a long empennage, and the two small rudders are placed above and below it. The wheel controls the warping of the wings and the elevator, the rudders being worked by pedals. The fixed frame joints are made by autogenous welding. The wing spars are also of steel, the ribs only being of wood. The pupils' machines are fitted with Anzani engines, but any other makes are fitted to order.

The Safa biplane was invented and constructed by MM. Caudron for the Société Anonyme Francaise d'Aviation, and is certainly one of the neatest and most interesting things in the show. The wings have an extremely high aspect ratio, and in practice this is increased by the fact that more than half the plane towards the rear is flexible, the rear uprights being quite close to the front ones. These uprights are fixed in swivels, and the whole wing is warped as in the Wright. The frame is neat and strong, the lower booms being carried straight through to the front under the lower plane and forming skids. The engine is placed in front with a tractor screw, and the pilot sits in a hole in the lower plane, controlling the warping and elevation with a lever, and the steering by a foot lever under the lower plane. Situated thus the pilot has an excellent view all round and a very handy control of everything, points which are too often overlooked in the design of machines which are excellent in most other respects.

The machine is extremely light, so much so, in fact, that the experimental machine flies quite well with a three-cylinder air-cooled 25 h. p. engine. The testing is being done at Paris-Plage close to Boulogne, so that any readers of *The Aero* who would care to see the machine working can easily arrange to do so. Also, machines are delivered at Paris-Plage, and a purchaser can, if he wishes, decrease the cost of transport by flying to England. In any case, transport is a comparatively small matter, for the machine is very easily dismounted for packing, and, as a matter of fact, the machine at the show was brought there on a little 10 h.p. lorry.

It may be well to mention that the elevator is merely a flexible extension of the monoplane tail, an arrangement which certainly makes for efficiency. The rudders are twin squares mounted on top of the tail. Besides being light and compact the machine is distinctly fast, having been clocked to fly at 75 kms. (47 miles) per hour with a 25 h.p. engine. A two-seater is now being constructed with a 50 h.p. engine, and it should prove one of the successes of the coming year if appearances go for anything.

THE CHANTIERS TELLIER.

As might be expected from a firm of such eminence, the Tellier machine is a fine piece of work. In general outline it follows standard monoplane practice, but in detail it differs very materially. The machine shown has a 60 h. p. Panhard engine, and to carry the extra weight, the main struts of the chassis are built in duplicate, the transverse member being a neat bow girder. The mast which carries the wing stays above and below the fuselage, instead of the more usual *cabane* and *pylone*, is built of four wooden poles united at their points and stayed wide apart, where they are built into the fuselage. Half-way along the wings are vertical posts, as in the Antoinette type of wing.

The horizontal empennage is now reduced to a comparatively small fixed plane with a very large elevator flap. The triangular vertical fin in front of the rudder is still retained. Steel cable is used throughout for wing stays instead of steel ribbon. Mr. Santoni, who holds the British concession, expects to have one of these machines in use on one of the English flying grounds at an early date.

PAUL KOECHLIN.

M. Koechlin shows a handsome two-seater monoplane which is in its general lines much like the two-seater of last year, but in detail it is much improved. The boxed-in hull is retained, but the chassis is entirely new. There is a single central skid, which, however, would be better if longer and stronger, and there is a pair of swivelling wheels carried in quite original telescoping forks held up by rubber tension springs. The empennage is cruciform, and the fixed horizontal portion is carried back so far that the oblong rudders work above and below it quite clear of the elevator, which is a large curved flap at the end of the empennage.

Lateral control is by ailerons pivoted on the extension of the front spar—a method which has both mechanical and theoretical objections, as already noted. Apart from this there is very little one could find fault with, and certainly M. Koechlin should know his business, for he has been experimenting for years, and his machine has proved so simple to control that on it Mme. Niel, one of the only three women who hold pilot's certificates, won her *brevet*.

CLERGET AND CO.

Certainly the longest aeroplane in the world at present is the 200 h.p. Clerget monoplane. This is, in fact, a tandem biplane, for what at first glance looks like a rather large tail is in reality a pair of planes as big as the main planes of a Blériot. The machine is quite one of the *clous* of the show, for it is fitted up to show what a military aeroplane should be. The usual pilot's seat is occupied by a mechanician to attend to the engine. Midway along the fuselage sits an observing officer, and at the front of the rear pair of wings sits the pilot himself, placed so that he has a really good view under the front wings and down to the ground on each side. Aft of the rear planes is a large vertical empennage, with the rudder, which is too small for the machine, behind it. Underneath both of these is a long horizontal empennage, and behind this is a very large semicircular elevator.

The chassis is simply a pair of A's carrying long skids, which in turn carry a simple pair of wheels with a long axle right across, which axle will inevitably give trouble on rough ground.

HENRY COANDA.

The Coanda biplane is certainly more than something of a freak. It is built entirely of wood, even to the planes, except for the uprights and the chassis, though this alone is certainly not enough to stamp it as impracticable; in fact, the general effect is rather taking than otherwise. The tail arrangements consist of an empennage in form of a St. Andrew's cross, and at the end of each surface is a triangular flap arranged so as to give a corkscrew action to the tail. These flaps are controlled by side wheels in the manner of the Antoinette controls. The real feature of the machine, however, is the replacement of the propeller by a turbine which is fitted in a huge nozzle at the bow of the machine. This is claimed to give an enormous wind velocity, but over such a small area it does not necessarily mean thrust, and it also appears as if enormous power would be necessary to drive it. The chassis is decidedly original also, and has points of worth.

HENRI FABRE.

M. Fabre, with whom Paulhan has collaborated in the designs of his machine, shows a couple of hydro-aeroplanes built according to his theories. These are, however, monoplanes with the small plane leading and a little elevator over the top of the leading plane. Each of the main wings has a mast about a third of its length from the inner end, and at the foot of each mast is a float. The front planes also have a float under the mast which carries them both, consequently while on the water there is a three-point suspension. M. Fabre has found from experience that no vertical rudder is necessary, for the endless V's in the leading plane act very effectually as rudders, so the whole plane is swung round its mast horizontally. That the whole scheme is practical is shown by the fact that on many occasions the machine has flown between ten and fifteen kilometres over the mouth of the Rhône without what the *chargé d' affaires* at the stand calls *un ammerissage* a "sea-landing."

LOUIS VUITTON.

One of the few humours of an eminently businesslike show is the Vuitton stand, whereon are shown an extraordinary helicopter and an equally extraordinary monoplane. It is unnecessary to mention the helicopter beyond stating that it could hardly lift its own engine. The monoplane, however, has ideas in it even if somewhat unconventional. The show machine is only a large model, as M. Vuitton was careful to explain.

The plane as may be seen, has tipped-up ends so as to increase the lift on the lower side if the machine heels over. Below it, so that it would make a nice pendulum, is the "cabin"—one always mistrusts machines with cabins, for the inventor who thinks too much about passenger accommodation is apt to forget essentials of mechanism. In the cabin are the controls. One lever moves the whole plane from side to side for lateral stability. Another alters the angle of attack of the whole plane, and it is hoped to do this by swinging it bodily on a single pivot situated somewhere about the centre of pressure. The tail is an absolute fixture, and is supported to act only as a damper. On each side of the cabin are large flaps strongly suggestive of elephant's ears. When these both deploy together in an attitude of expectation they are supposed to act as brakes. When only one operates at a time it is expected to perform as a rudder. The whole is a remarkable instance of misplaced ingenuity.

PASSERAT AND RADIGUET.

This firm makes a rather neat monoplane known as the "Sylphe," which is fitted with a four-cylinder radial Berthad valveless motor. The chief feature of the machine is the movable wing-tips, which swing on an extension of the front main spar in much the same way as that of the early Blériots and of the modern Goupy. It is doubtful whether this arrangement is really worth fitting, for when the wing-tip moves it becomes a small plane on its own account and one with a very small and, therefore, inefficient aspect ratio, besides leaving the main wing with a worse aspect ratio than it originally had.

The wings, however, are beautifully made, and it would seem that the firm shines rather as constructors than as designers. The tail arrangement consists simply of a square rudder working in a bisected tail-elevator, which is fitted behind a triangular empennage. In the machine shown the chassis is much too narrow, and will certainly give trouble when put to practical test.

THE ANTOINETTE.

Of the Antoinette there is little new to be said. The particular machine shown is a two-seater, with the seats arranged tandem fashion, and from both the view earthward is decidedly limited. The landing chassis has been slightly altered, being somewhat stronger all around, and the skid is brought further forward and is more curled up, so having less tendency to "dig in" on landing. For the first time an Antoinette is shown with a wooden propeller instead of the old metal "tennis racket," though wood propellers have been used on the racing Antoinette for some time.

The engine has now a magneto and an exterior flywheel, which, with the wooden propellor, probably accounts for its better performances during the past few months. The Antoinette remains, as it began, the most graceful of all machines in the air, but is still suffers from a bad chassis, in effect though not in mechanism, and a most unnatural form of control, *i. e.*, wheels on each side if the fuselage, with their axles horizontal and thwartwise.

ROGER SOMMER.

M. Sommer shows a biplane and a monoplane. The biplane is practically exactly like that shown at Olympia, the chief difference being that ailerons are now fitted to the lower plane, and that the central lever is placed centrally instead of to one side. Double surface planes are now used. The variable angle to the fixed portion of the tail has been done away with and a rear elevator fitted behind the tail, this being coupled to the front elevator.

The monoplane is of a somewhat ordinary type. The fuselage is mounted on the usual type of chassis with two pairs of A struts and skids. A single axle and two wheels are used, which axle will cause trouble on rough ground. The tail is bisected by the fuselage, the two halves of the fixed portion having a variable angle, as in the early Sommer biplanes. The elevators are hinged to the rear of these sections and are worked by a lever which also warps the wings. The rudder, placed between the elevators, is worked by the feet. A Gnôme engine is used, and this is cased, rather inaccessibly, inside a sheet steel box, which box has projections on each side to accommodate the motor, and these projections, owing to their shape, may cause unnecessary head resistance.

Under the tail is an unsprung skid.

DEPERDUSSIN.

The Deperdussin is a neat monoplane without many original features, and it is chiefly distinguished for good work. There is a long, very narrow square section fuselage, terminating in a flat empennage with an elevator flap behind it. Over this is a vertical empennage with a square rudder behind. The landing chassis is spoilt by two long struts coming down from the fuselage and turning up in front like the single strut of the Antoinette, thus giving two points with which to "dig in." The most original feature is the fact that six-blade propeller is fitted, and as each opposite pair of blades is on a slightly different plane from the next, it seems likely that they might interfere with one another's efficiency.

G. VINET.

The Vinet monoplane is an exceedingly pretty little machine, somewhat reminiscent of the Nieuport, but larger, and, as it carries more power, necessarily stronger. The body is entirely cased in, but the engine stands out alone on the top of the chassis, the rounded bow of the hull being just behind it. The chassis arrangement is neat and simple, consisting, as it does, of Farman type skids, but it has bad points. A single axle runs across between the skids, and there is a wheel outside each skid. In front of the axle a cross-bar runs, and on this cross-bar, about a foot from each skid, there come two uprights which support the main engine bearers. As this cross-bar is not a foot off the ground, there seems every probability of it fouling a large stone, or even a lump in the ground, in which event either the machine would stand on its head, or the cross-bar would be carried away, probably bringing the engine with it.

The control of the machine is by a wheel, with its axle set horizontally into a vertical post, the swinging of the post controlling the elevator and warping, and the twisting of the wheel the rudder. Both rudder and elevator are combined with a cruciform tail of the type made familiar in England by the Avis, and Pointer monoplanes. The whole machine is excellently made and looks all over a flier.

SLOAN AND COMPANY.

The Sloan "Bicurve" is one of the curiosities of the show, though by no means a freak, for the upper plane is but little more curved than that of the successful "Silver Dart," and the lower plane is double curved, with a dihedral angle in the centre and dropped winged tips like those of De Lesseps's *Frégate*, both of which machines have flown and flown well. The machine is certainly beautifully made and finished, and should be well worth watching in the future. The chief peculiarity is the formation of the main planes, the rest of the machine being of ordinary design.

There is a front elevator, a slightly curved empennage, which does duty for a tail, and aft of this are a couple of little elevator planes behind which again is a rudder. The lower planes carry each a small aileron, which will probably have to be enlarged in practice. The chassis is somewhat on Farman lines, but the wheels are supported on coil springs.

The Gnôme engine is in front of the planes between the elevator struts, about the only example of this practice, and there is a long fuselage of the Blériot type. In this is fitted just above the lower planes an elaborate hull like a section of a "governess cart," and in this sits the pilot with the wings on each side of and slightly behind him, the passenger's head, the engine, and the tanks in front, and with the horizontally lateral view cut off by the upward sweep of the wings. Consequently, unless the machine be fitted with a periscope, the pilot will only get an occasional glimpse of anything outside of the machine itself.

HANRIOT.

A magnificent specimen of the Hanriot machine is shown. It is difficult to say where, in the light of present day knowledge, much improvement could be made in the machine. Any alterations would be more a matter of taste than of fact. Perhaps a lighter and simpler chassis would be an improvement.

Marcel Hanriot told the writer that he is having a machine got through for himself with a 50 h.p. Gnôme engine, and that when it was thoroughly tuned up he intended going out for speed, for he expected the machine to be considerably faster than anything else with the same power. Certainly, the general lines of the Hanriot suggest speed, and it will be interesting to see how the new machine turns out in practice. One of the points on which M. Hanriot prides himself is the ease with which one can learn to fly on one of his machines. He told the writer that if a man has any natural tendency towards aviation he can generally learn to fly in four days.

P. J. GREGOIRE.

On the stand of the famous engine maker is found a "Military" two-seater Hanriot. This machine is in all respects similar to the single-seater, but is fitted with a second seat in front of the usual driving seat. This seat is fitted with a complete set of controls, so that the pilot and passenger can drive alternately on a long trip, or the observer can take charge if in war time the pilot should be hit. This machine is fitted with a magnificent Grégoire-Gyp engine of 60-70 h.p. set upright, and not inverted as is the usual practice with the smaller Gyp engines. The combination makes a very handsome and serviceable machine.

FOREIGN NEWS

By W. H. Phipps

Austria

Mounted in his Etrich monoplane, (which was described and illustrated in the November AIRCRAFT, page 325) Karl Illner recently succeeded in winning a prize of $4,000 offered by the Viennese Municipality for a flight from the Austrian capital to Horn in Lower Austria and back, a round trip of 94 miles. The trip was made with one stop, and lasted 2 hours and 17 minutes. The greatest altitude reached was about 3,000 feet.

England

A new and novel machine which is giving a very good account of itself is the Valkyrie monoplane constructed by the Aeronautical Syndicate and now undergoing trials at their school at Hendon. The monoplane is what might be called the "tail-first" type in that it has a large rigid plane in front and a small elevator situated below and a little behind it. From a side view the machine somewhat resembles the old style front-rudder Wright machine, with the top surface of both the elevator and main planes removed and the whole mounted sufficiently high on skids to allow a clearance for the single 7' 3" propeller.

The general dimensions of the "Valkyrie I" are: span, 34 feet, with a chord of 6 feet and a total overall length of 22 feet.

The monoplane has already flown well and bids fair to become one of the leading "all British" machines.

France

NEW WORLD'S RECORDS.

On October 28th, at Buc, Maurice Tabuteau, the crack biplane driver, who recently achieved such success at Biarritz and at San Sebastian, broke all records for duration and distance, in a flight counting for the 1910 Michelin Cup.

Rising at 8.47 a. m. on his Maurice Farman, propelled by a Renault motor, he circled a seven and six-tenths kilometre course, without once alighting, until 2.48.35 p. m.

The new duration record is therefore *6 hrs. 01' 35*, as against Olieslaegers' 5 hrs. 03' 05" 1/5 (Rheims, July 10th); the official distance was *465,72 kilometres*—supplanting Olieslaegers' 392,75 kilometres.

The speed of the biplane increased throughout the flight as its load of gasoline grew lighter: at the finish Tabuteau was travelling at between 51 and 52 miles an hour.

Thus in the last four days of October, and within the space of eighty-one hours, aviation World's Records once more crumbled and the names of Olieslaegers, Morane and Wynmalen made way for those of Tabuteau (Duration and Distance), Leblanc and Grahame-White (Speed) and Johnstone (Altitude).

A few records for speed (over intermediary distances between 100 and 400 kilometres) and for distance (in 2, 3, 4, and 5 hours), remain to Aubrun and to Olieslaegers: all the rest fell by the board at Buc and at Belmont Park.

The Comte de Lambert recently fitted a Gnôme engine to his Wright machine; it is said to have behaved excellently on its first trial, exhibiting increased speed and better stability.

Trials are being made at Rheims by a Russian prince with a special Hanriot monoplane which he has had built. It is painted in white lacker and gold and fitted up in luxurious style. The prince has already made several successful flights in this elaborate flyer, one of 2 hours' duration, and has announced his intention of flying from Brussels to St. Petersburg.

On October 12th, Lieut. Binda, on a Maurice Farman machine, flew from Buc to Chartres, a distance of 75 kilometres, where he stayed for two hours before starting on the return journey, which was made in 45 minutes.

The treasurer of the Aero Club of France announces that up to date prizes amounting to $500,000 have been won in events held under the auspices of the club.

On October 15th, Parisians witnessed the sight of three aeroplanes pass over their city, and of the trio, one, a Henry Farman biplane with Legagneux as pilot and Martinet as passenger. Of the other two, one was a Henry Farman, piloted by Wynmalen, while the other was a Maurice Farman, driven by its designer.

Still another successful monoplane has made its appearance at Chalons: that constructed by Train. Although fitted with a motor of but 20 h.p., it has repeated flown for an hour at heights up to 1,200 feet.

After a long period of instruction on her Antoinette monoplane, Mlle. Marvingt succeeded on October 15th, in passing the necessary tests in order to obtain her pilot's license. She is the third woman to obtain a pilot's license from the Aero Club of France, the others being Madame Raymonde de Laroche (Voisin) and Madame Niel (Koechlin). Mlle. Hélène Dutrieu's license has not been granted owing to irregularities in the tests.

Although he had spent some time during the last few months experimenting with various types of aeroplanes, Capt. Madiot, who has just been killed at Douai, was chiefly famed for his success in designing man-lifting kites for military purposes.

French Soudan

M. Bruneau de Laborie, the well-known French sportsman and swordsman, has offered to place himself and his machine at the disposal of the French Government for an experimental aerial mail service in the Soudan.

Germany

The second national aviation week at Berlin-Johannisthal brought excellent results on the whole. The prizes presented by the War Office and Dr. von Bleichroeder were hotly contested by a number of aviators, the entries numbering twenty-one men with 45 machines. The final results were:

War Office and Totalization of Duration Prize: 1st, Lindpaintner (Sommer & Albatros) 11 hours, 37 minutes, 53 seconds; 2d, Jeannin, (Aviatik) 8 hours, 7 minutes, 20 seconds. Weight-Carrying Prize, given by the War Office: 1st, Brunhüber, (Albatros); 2d, Wienczieri (Blériot). Altitude Prize: 1st, Wiencziers (Blériot), 1,560 metres. Bleichroeder Prize: 1st, Wiencziers, 7 minutes, 27 seconds. Passenger Carrying: 1st, Thelen, (Wright), 1 hour, 50 minutes, 27 seconds. Shortest Start: 1st, Thelen (Wright), 29.74 metres. The daily prizes were won by Lindpaintner (3) Jeannin and Brunhuber (2 each) and Thelen (1).

The following day a joint military flight was arranged from Johannisthal to the Doeberitz drill-ground to test several makes which the War Office is greatly interested in; an Aviatik, an Albatros and an Etrich started, each carrying an officer as passenger. Half way the machines were met by a Farman, piloted by Lieutenant Makenthum, who turned and accompanied the caravan back to Doeberitz, from whence he had come. The whole raid was most successfully carried out.

The Parseval aero-hydroplane was again tried out on the Plau at Mecklenburg. Rising from the water the gigantic machine rose to a height of 220 feet and had traversed a distance of from 4 to 5 kilometres when it suddenly turned over and plunged into the water. The pilot was picked up unharmed.

Italy

On October 17th, Da Zara, carrying the Countess Salom, flew from Bovolenta to Padua and return. In the evening of the same day he repeated the trip.

The Italian Army Blériot which has recently been tried out at Etampes will be piloted by Ginocchio; on October 15th, he flew with a passenger for two hours.

Russia

The close of the St. Petersburg Meet was marred by the fatal accident to Capt. Matsievitch. This Russian officer was gilding down from a great height on his Henry Farman machine, when suddenly the machine was seen to pitch forward, probably owing to the breaking of the front control. The aviator was thrown from his seat and instantly killed, reaching the ground before the machine.

On October 5th Lieut. Pietrowsky, on his Blériot flew with a passenger from St. Petersburg to Kronstadt and return.

On the same day, Efimoff made a flight of 1 hour, 55 minutes, while Roudineff was flying above St. Petersburg, the Neva and the sea, for 54 minutes.

NEWS IN GENERAL

By D. E. Ball

The Editor of AIRCRAFT enjoyed a short air-trip with J. C. Mars, on his Curtiss, at the close of the International Aviation Meet. It was Mr. Lawson's first taste of actual flying and the main impression noted was that of the absolute security when aboard a well-built machine in the hands of a first-class man:—under such conditions the idea of a mishap seemed too remote to contemplate.

As a matter of fact, of all the more famous and long established makes of aeroplanes, Glenn Curtiss' conception is the only one which at this writing has paid no toll of human life, whilst on the many-bridged road of Progress.

Just as the November number of AIRCRAFT had gone to press, on October 8th, Arch Hoxsey, in a Wright biplane, flew from Springfield, Ill., to the Country Club Ground at Clayton, St. Louis, a distance of 86 miles, in 2 hours, 45 minutes, thus establishing an American record for sustained cross-country flight.

The flight was the opening event of a ten days' meet held under the auspices of the Aero Club of St. Louis.

Later, during the same meet, Hoxsey also distinguished himself by taking ex-President Roosevelt for a short flight.

Except for Leblanc, all the flyers at St. Louis drove Wright biplanes.

Result of the Baltimore Meet
November 2-12

Duration—Latham, (Antoinette), 3 hours, 53 minutes, 31 1/5 seconds; Drexel, (Blériot), 1 hour, 59 minutes, 23 2/5 seconds; De Lesseps, (Blériot), 1 hour, 55 minutes, 47 3/5 seconds; Hoxsey, (Wright), 1 hour, 21 minutes, 46 2/5 seconds; Ely, (Curtiss), 7 minutes, 40 1/5 seconds; Willard, (Curtiss), 5 minutes, 30 seconds; Radley, (Blériot), 3 minutes, 31 3/5 seconds.

Latham's time in the flight over the city for *The Baltimore Sun* prize is not included in the above, it having been recorded outside of the official time of the day upon which it was made. That flight lasted 42 minutes, 10 1/5 seconds.

Cross-Country, (to Fort Carrol and return, round trip about 18 miles)—Drexel, (Blériot), 23 minutes, 34 4/5 seconds; De Lesseps, (Blériot), 26 minutes, 15 seconds; Latham, (Antoinette), 28 minutes, 58 seconds.

Bomb-dropping, in competition for the Commodore Barry trophy— Latham, (Antoinette), 15 points; Drexel, (Blériot), 6 points.

Passenger-Carrying—De Lesseps, (Blériot), total time, 16 minutes, 48 2/5 seconds.

Best altitude records Hoxsey, (Wright), 5,330 feet; Drexel, (Blériot), 4,855 feet; Latham, (Antoinette), 2,373 feet; De Lesseps, (Blériot), 1,722 feet.

Aero Club of America Elections

At the annual elections of the Aero Club of America, held November 14th, the following officers were elected:

President, Alan A. Ryan.
First Vice-President, James C. McCoy.
Second Vice-President, Dave H. Morris.
Third Vice-President, James A. Blair, Jr.

R. P. Parker, a sixteen-year-old boy, is the inventor of a monoplane which, it is firmly believed by aeronautic enthusiasts of New Orleans, will exceed any machine of the type ever flown. In addition to speed and ability to carry a heavy weight, it has a remarkable structural stability. Those who have examined a model of the machine declare it to be one of the strongest in existence. In fact, so successful have tests of the model proved, that work will be begun on a full length machine. M. E. Hart, manager of the Enterprise Electric and Auto Company, who is an expert aeronautical engineer, will build the machine, which will cost about $1,000.00. Young Parker will, however, superintend the work

The Pennsylvania Rubber Company has been experimenting for several months past to secure a satisfactory fabric for aeroplanes, and have now produced their "Penacloth." It is proofed with rubber and colored yellow in order to protect the rubber from the injurious light rays. It has been tested for durability and found not to deteriorate in sunlight.

The weight of Penacloth is 6-1/3 ounces per square yard, the strength being 130 pounds per square inch. It is forty inches in width.

The Aero Club of the University of Illinois during the past summer has carried on experiments with its home-made glider. The Club starts the fall work with a membership of thirty, and plans a year of activity with lectures, discussions and experimentation on aeronautic problems.

Messrs. Marburg Brothers have placed upon the market three articles which should be of considerable interest to those interested in the construction of aeroplanes.

Their "M. E. A." high tension magneto is an instrument manufactured in Stuttgart, Germany.

The S. R. O. ball-bearing is made in Switzerland; it is the shape of the cage and is quite different from that of other bearings. It works like a scoop, thereby forcing a very liberal circulation of oil.

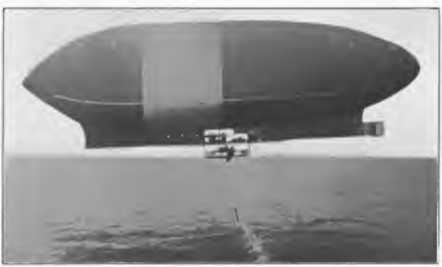
"Duralumin," the third product, is a metal which according to tests made by well-known German testing stations, is as light as aluminum and as strong as steel. It can be rolled in various shapes and can also be drawn in tubes.

The John A. Roebling's Sons Company have produced an Aviator Cord and Wire which are made with special care from the highest grade of steel. The Cord consists of a number of fine wires of great strength stranded together whereas the Wire consists of one single wire.

Muncie gained its first notice in the aeronautic world when Arthur Humfeld, Vincent Fox and Arthur Ford made a short flight in their new monoplane recently. It is built of linn wood and is 32 feet wide from tip to tip. The plane is 7 feet wide and the machine from the front of the propeller to the vertical rudder is 24 feet. The total weight with one passenger is 600 lbs. The steering device is something on the order of the steering wheel of an automobile and foot control. The steering wheel controls the horizontal rudder which lies in a vertical position to direct the course of the machine and the foot control manipulates the vertical rudder which lies in a horizontal position and regulates the rise and fall of the craft.

The Holbrook Helicopter Aeroplane Co., have built an aluminum biplane which made a successful flight on August 14. It is fitted with a De Chenne Aerial Engine, which the inventor claims will run all day and give its full rated horse power. Every part of the machine, engine and all, was constructed in Joplin, Mo.

Messrs. Hurst & Company, publishers, have announced "The Boy Aviator Series," which comprises six typical and well written Airship Stories.



THE WELLMAN AIRSHIP IN MID-ATLANTIC.

The big dirigible carrying Walter Wellman, Melvin Vaniman and three others left Atlantic City at 8.05 a. m. October 15th, in a heavy fog; she kept up wireless communication with the outside world until 12.45 p. m. October 16th, (when off Nantucket Island), after which time she lacked the power to transmit messages, but at no time was unable to receive them, the crew being aware of the search and look-out made for them but unable to indicate their whereabouts.

The motors became disabled, presumably through the jerking of the equilibrator, which, as foreshadowed in last month's AIRCRAFT, was the primary cause of the trip's failure.

The "America" was abandoned at 7 a. m. October 18th, when between New York and the Bermudas: she was up and manned for 71 hours (about 33 hours longer than Zeppelin's over-land record) and drifted and motored about a thousand miles in that time

At times, when a rise in temperature occurred, the balloon would rise several hundred feet into the air, equilibrator and all.

That an untried aircraft should have done as well as the "America" speaks volumes for Vaniman's capacity as an aeronautical engineer: both he and Wellman deserved unstinted praise, however impossible of realization their scheme was at this date.

The picture shows the airship drifting broadside before the wind just before the crew was taken aboard the rescuing steamer, the "Trent."

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CAPITAL WANTED—For the building of a new 50 H. P. motor. Also for the building of a self-balanced, passenger-carrying biplane, designed for long distance flights and equipped with two motors. Address: Box 728 Aircraft.

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WANTED—Capital to build flying machine; exchange for part interest in invention, or will sell share; patent applied for; also most up-to-date folding umbrella, patent applied for. Address: Flying Machine, box 174, Washington, Pa.

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FOR SALE

FOR SALE—Blériot monoplane, 24 horse power Anzani motor, imported from Blériot factory this year. Will be sold big sacrifice by Aviation Company, closing up its business. Box 727 % Aircraft.

BIPLANE GLIDER for sale. Best material and workmanship. Only $50.00. Address, Ray Herrington, 654 Mt. Prospect Ave., Newark, N. J.

CURTISS type aeroplanes, guaranteed to fly; construction perfect in every detail. Address "Aeroplane," care Aircraft.

FOR SALE—20 H. P. 4 cylinder air-cooled, Genuine Curtiss Motor. Has been used very little, in good condition. Weight 100 lbs. Used in 650 lb. biplane which made jumps of 200 yards. Have since installed larger motor. Price $325.00. Address: L. B., 725, Morgantown, W. Va.

FOR SALE—Demoiselle type monoplane; guaranteed to fly; ready for immediate shipment. Blue prints and instructions for building monoplane $1.00. Write for prices to J. Horat, Lafayette, Ind., manufacturer of "Aeroplanes" to order.

AEROPLANE FRAME DETAILS: 12 figures, showing most approved methods of joining frame members, styles of turnbuckles, etc., all easily made. 25 cents. M. S. LEWIS, 778 West 11th St., Oakland, Cal.

MODEL AEROPLANE—Will fly 200 ft. 15c postpaid; models and supplies at lowest prices; send for price list. Bloomfield Aerial Construction Co., Bloomfield, N. J.

FOR SALE—30 H. P. Darracq type aeronautical power plant, complete with 6 ft. Shebler 1½ in. carburetor and Bosch Magneto for the 1st check for $250. Was run but once to test monoplane. A. M. Johnston, 3403 Southport Ave., Chicago, Ill.

FOR SALE—One 50 H. P. "HF." or Harriman. Aviation Engine; new: $700.00. This is the same size engine that the Harriman Motor Works are charging $1,675.00 for. Address, Box 3, Girard, Kansas.

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FINE MECHANIC—Used to exact work, any material; technical education, knowledge of aerodynamics, age 29, weight 138, wishes to connect with builders of aeroplanes with opportunity to learn construction and operation of same. Address: V. E. N., care Aircraft.

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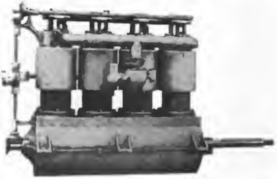

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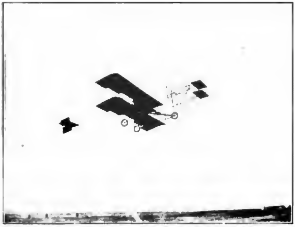

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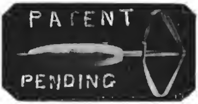

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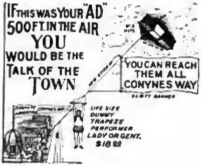
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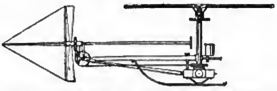

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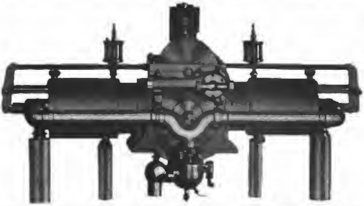

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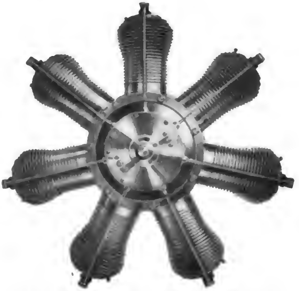

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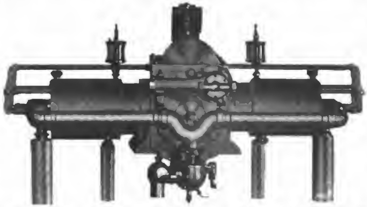

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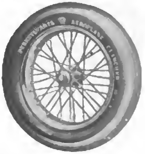

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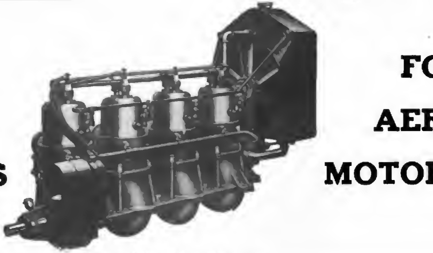

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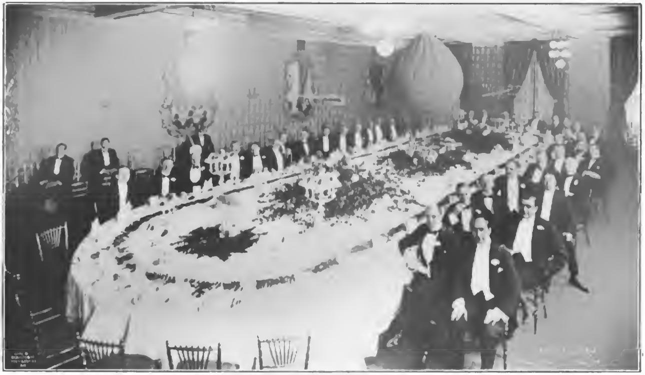

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Vol. I. No. 11 New York, January, 1911 15 cents a copy $1.50 a year

LAW AND THE AIR

By Denys P. Myers

(Continued from October AIRCRAFT*)*

INSURANCE IN THE AIR

IN no subject connected with aviation does more lively speculation exist among all classes than in its relation to insurance. If you broach the matter to an insurance man he will eagerly question you to find out if you know anything that will prove helpful to him; lawyers, and especially law librarians, will pump you dry, and the general public will argue till bedtime,—usually all to little purpose.

This article aims at summarizing what is certain on the subject.

The insurance man's quandary has arisen because he has no data upon which to base rates. In actuarial work in other fields, the statisticians have produced elaborate tables showing the death and accident rates of men both in general and in particular trades, as well as the possibility of damage to property by fire and by other means. Upon the facts thus set down they base their rates. At present only Lloyd's, which is virtually a betting ring on any chance, can consistently insure either aviator or air-craft. Few "vital" statistics are in existence regarding aviation. Here are some: Georges Besançon, secretary-general of the Aéro-Club de France, recorded between 1899 and February, 1906, 1,207 balloon ascensions, with 3,388 passengers. C. Busley in *Illustrierte Aeronautische Mitteilungen* for January, 1906, recorded 2,061 ascensions in Germany, with 7,570 passengers, among whom were 36 accidents with 1 death. The accidents were: 11 cases of fractured ankles; 4 broken legs; 1 broken arm; 7 knee injuries; 6 dislocated shoulders; 5 injured feet; 1 dislocated hand. None of these, be it noted, refers to heavier-than-air craft; the statistics tend to show, however, that going up in the air is considerably more dangerous as yet than railroad traveling, where (in 1908) out of 890,009,374 passengers and 1,458,244 employees, 10,313 were killed and 105,234 injured.

However, the mortality is certainly not high for a development still in its experimental stage, and it is entirely true that the insurance men are anxious to write insurance for aviators, on their machines and against accidents to third parties. The machine is the easiest problem and one firm in Boston has a policy to protect machines, nine of which were in force on October 1st last.

This policy is upon the body, machinery and equipment of the aeroplane, separate or assembled, anywhere in the United States or in Canada or on board coastwise steamers. It is written at from 2 to 2½ per cent. on three-fourths the manufacturer's cost, and the essential parts are:

> No. 1—Against actual loss or damage to the Aeroplane hereby insured by fire arising from any cause whatever except the collision of said Aeroplane with the earth or any other object than another Aeroplane while in flight; also while being transported by any common carrier by land or water, against loss or damage caused by stranding, sinking or collision, burning or derailment of vessel or car transporting said Aeroplane.
>
> No. 2—This policy is also made to cover against loss by collision with another Aeroplane while in flight.

In explaining this policy, its originator said: "We cover everything except collision with buildings, trees or the earth, in which case we conceive that the machine ceases to be an aeroplane and becomes junk. We cover from loss while in the hangar and in transit, except from damage due to faulty packing or shifting of cargo. But the main thing is the moral hazard. We seek to make the owner share the risk by writing insurance only up to three-fourths of the cost to the manufacturer not the cost to the purchaser. Thus the owner has a quarter interest in the safety of the aeroplane. Also we offer a variation of one-half per cent. in rate, thus being enabled to protect ourselves to a certain extent against the careless owner."

Undoubtedly the insurance companies which cancelled the policies of Allen A. Ryan, manager of the International Aviation Tournament, because he would not sign off liability during the course of the meet, acted on the safe side of the law so far as those policies were concerned, but that says nothing for the situation in that general regard. Mr. Ryan neither owns nor operates an aeroplane and evinced no intention of flying. The action of the companies, then, to be within the law, must have been based on provisions for cancellation if the underwriters should suspect the insured was likely to undertake anything to make him a greater risk than he agreed to be by the terms of the policy. Cancellation under such a provision would, of course, be perfectly defensible, but, in its absence, no company would have a right to declare a policy void.

The point was made in a recent case decided by the Supreme Court of Colorado on March 7, 1910 (*Pacific Mutual* v. *Van Fleet*, 107 Pac. Rep. at 1092). The insured lost his life in a balloon trip for pleasure while holding a policy classing him as a risk, as a railroad brakeman. The policy classed all insured under it by occupations, and provided that, should the insured engage in a more hazardous occupation than the one under which he was accepted as a risk, the principal and weekly indemnity should be for such amount as the premiums paid would purchase at the rates fixed for such more hazardous occupation. On clauses like this, said the Court:

> "The uniform holding is: where, as here, the only classification made by the insurance company is of occupations and not of particular acts or exposures, a change of occupation such as will defeat the policy must be a permanent change—or a tem-

> porary change which, in all essential and substantial respects, for the time being, is a change of occupation—and that the nolicv is not defeated by the performance of some individual act or indulgence or enjoyment in some particular exposure, which is of a more hazardous nature."

The justice here cites some half-a-dozen cases to the same effect, several of which refer to men injured while engaged in hunting for pleasure.

Actual insurance of air-men and air-craft, however, including points in the policy already described, will group itself into five categories: guaranty against accidents, both material and corporal, from third parties, while under way; indemnification for accidents to self or craft from its own engine; insurance of aerial employees; damage by fire (partially covered above); and insurance of the individual owner and passengers.

The companies can with comparatively little difficulty solve most of these problems, except that assuming the risk for a regular aviator will give them considerable pause. They must tackle it, for almost everybody who sees a flight wants to be a passenger himself, which means that many present policies are affected by the desire of their holders to fly. Moreover, in this country policies usually contain a clause to the effect that the policy is incontestable after having run a given time. Fraud will vitiate the clause, but it can be accepted as certain that fraud would not be found in the case of a man who had been insured for a considerable time and had, during the life of the policy, got the flying habit. This statement may be said to hold for aoy policy a few years old, although one written to-day might be held fraudulent, if the insured took to the air.

In this regard, it may be noted that Claude Grahame-White was refused insurance at Boston and on cabling to Lloyd's of London received word that they would accept him as a risk at 35 per cent., which is virtually the rate at which crowned heads are insured in these days when every anarchist has a revolver.

Abnormally high premiums will be the rule for air-men until the public and the companies get over the idea that flying is foolhardy. Some dozen European companies have announced terms for aviators, or rather aeronauts, for practically all of them consider the dirigible. The German publication *Argus* (February 4, 1909, p. 100) and the French *Nouvelle Revue Aérienne* (February 10, 1909, p. 94) gave some of the rates, but it cannot be said what business was done with them.

Argus gives the terms of four German companies. The first, to cover each aeronaut and for every ascension, made a rate of 1.8 marks per 1,000. A second offered annual insurance for death or permanent incapacity suffered in a dirigible at the rate of 1.6 marks; in a non-dirigible, 2 marks, and for daily indemnity, of 1 mark, 3.2 to 4 marks, the rate depending on the position of the person underwritten. Per voyage, the same company would accept risks for death or incapacity at 0.4 to 0.5 marks, or for indemnity at 0.8 to 1 marks. It is also noted that this concern had written 100,000 marks against death chances, 150,000 marks against permanent incapacity, and 50 marks against indemnity. A third company added to the general conditions of the policy a surcharge of 4.5 marks to the insured for each ascension and 1.7 marks for each member of the crew. A fourth company added to the general conditions of the policy, the name of the craft, the time and place of the ascension, and charged, by ascension and by day of the voyage: against death, 0.5 marks; incapacity, 0.5 marks; indemnity, 1 mark.

One French company reports these terms: Against accidents to third parties, 20,000 francs principal, 500 francs premium, for accidents proved, the latter clause pointing of course straight to litigation to recover. In addition, this company added 50 per cent. to the premium on policies limited to France (or 750 francs) and doubled it, making a total of 1,000 francs for policies outside of France. It would accept mechanicians on a 40 per cent. basis up to a principal of 25,000 francs. On a proved accident to the pilot it asked 8 per cent. on the principal. Another company made a general rate of 8 per cent. up to 50,000 francs against death or permanent incapacity, or 25 francs per day indemnity.

Another company would underwrite to safeguard third parties—the proverbial innocent bystander—at 550 francs per 15,000 francs guaranty to victim or 100,000 francs in case of catastrophe; or 600 francs premium per 25,000 francs principal, or 100,000 francs in case of catastrophe. Still anothe French company demanded 950 francs premium for every 3,000 francs recompense.

Finally one insurance organization made terms under four categories. For general insurance of the pilot and personnel, 35 per cent., or 1,050 francs for 3,000 francs premium; for individual accidents (calculated by ascensions with a minimum of 20 ascensions), 10,000 francs principal, in case of death or permanent incapacity, 15 francs for proprietor and 30 francs per ascension for pilot or employees; for civil responsibility in case of accident to voyagers, 2,400 francs per 30,000 francs principal; for accidents to third parties, 750 francs per 30,000 francs.

All of which is pretty much without rhyme or reason, but is certainly illuminating as indicating the desire of the insurance men to get to the people of the air.

(*To be concluded in February* AIRCRAFT.)

Note—The writer is indebted for many of the above facts to Le Code de l'Air *by Gaston Bonnefoy: Paris, 1909.*

RECORDS AND STATISTICS

By G. F. Campbell Wood

It was the intension of the compiler of these statistics to publish in the next number of AIRCRAFT a full list of fatal aeroplane accidents up to December 31st, thus bringing the record to the close of the first decade of the twentieth century; so many letters, however, have been received from readers requesting authoritative information on the question and questioning the accuracy of lists published elsewhere, that it was decided not to delay the publication of the table given below.

The cause of Human Flight cannot be worse served than by seeking to ignore or to belittle the loss in human lives for which it is responsible; it is not paradoxical to say progress in the art is founded not on its successes but on its failures, for every set-back, every accident, carries with it a lesson, which, if understood, gives an indication of the remedy which will bring about the prevention of its recurrence, in other words, shows where to step, to step *forward.*

It must be a source of intense satisfaction to the intelligent student of, and believer in, aerial navigation to note how large is the proportion of these accidents due to the breakage of parts of the machine, for this implies a fault in construction and not in *principle,* and it is obviously only a matter of a comparatively short time before the construction will be adapted to meeting the strain under all circumstances when in its element, just as it has been in land-vehicles; in the infancy of the Art and at a time when lightness of construction is a necessity, these accidents are bound to occur; their proportion to the number of men flying is not increasing but diminishing, and it will continue to do so.

More disquieting than all these combined are those few accidents attributable to loss of control; how much is due to the present-day designs of flying machines, and how much to the fallibility of the operator—the personal equation—is hard to say; the former will naturally improve by the force of circumstances, like in all other forms of locomotion; it is in the latter that lies the true "danger" (as it does of course in that of every other mode of conveyance once it is so perfected as to be of common use).

When machines are built with such a reserve of strength that breakage is an almost unheard-of occurrence, when control in the three dimensions is adequate to meet any emergency, accidents will still occur where the destination and route to follow are left to human volition, and this, however easy the handling of the craft may become; they will then, however, be limited to purely human failings such as obvious carelessness, recklessness, inexperience, physical or mental ailment or deliberate destruction, which will exist as long as "Errare humanum est" remains the truism it has heretofore been.

In the table here appended, figure twenty-five accidents which prior to December 15, 1910, resulted in twenty-six deaths; let it be well understood that these refer to motor-driven aeroplanes only; those entailed in gliders, such as Otto Lilienthal's, (August 9, 1896, at Gross-Lichterfelde, near Berlin), Percy S. Pilcher's (October 1899, near Rugby, England,) and Eugene Speyer's (June 17, 1910, San Francisco), or in motorless flying machines or "dirigible parachutes" such as Letur's and De Groof's (Cremorne Gardens, London, 1854 and 1864), not being included.

Several names of aviators reputed killed have been omitted from the list because of lack of corroboration of the report of their death. Among these may be mentioned Enea Rossi, who had a fall near Brescia, Italy, on September 7, 1909, and Aladan de Zsély, written also Zosely and Zoseley, reported killed near Buda-Pest, on June 2, 1910. Bréguet, Prince Popoff, de Baeder, Duray, Barnes, Raymonde de Laroche, Legagneux, Lieutenant Matzievitch (no relation of Captain L. M. Mazievitch) and Peeters were also reported as being mortally hurt or actually dead, at different times this year; they are, however, all well at this date (December 15th). In the same way, on lists of casualties published in Europe figure constantly the names of Brookins, Ely, Dr. Walden, Hamilton, who, at this writing, are all thoroughly alive.

Regarding the last fatal accident, that of Cammarota and his passenger, on December 3rd, only incomplete cabled accounts have been received at this writing.

It is the first time both aviator and passenger have been killed in an accident; in one other case, the passenger (Selfridge) was killed, the aviator (Orville Wright) escaping with serious injuries, and in another the pilot (Poillot) was killed, the passenger (Gérard Partiot) being but slightly hurt.

These three are the only fatal accidents to have occurred in "two-man" flights.

It was also reported that, on the same day, Walter Archer, a seventeen-year-old boy, was killed at Salida, Colorado, the remarkable tale relating how he rose from the ground in a machine designed by him and receiving its tractive power through the aid of an electric feed-wire 700 feet long, wound around a drum; readers of this startling news-item were asked to believe that the machine was an *aeroplane* which rose *vertically* until the wire was completely uncoiled, that the wire then tightened and snapped under the strain, the machine crashing to earth, when its propeller ceased to revolve.

This sensational lie was concocted by some newspaper-men who were certainly a disgrace to their profession; there was no "aeroplane" and no "Walter Archer," much less an accident.

What credence such a tale can acquire may be gauged by the wide distribution it obtained as a news item. A relative of the writer crossing the Atlantic actually read an account of it in mid-ocean in the wireless daily bulletin published on shipboard, the headlines reading of course: "Another Fatal Aeroplane Accident."

Many have been led to believe from the rapidly growing list of casualties, that flying is becoming more dangerous; there can be no question that it is exactly the reverse which is the truth; at least twelve times as great a distance was flown this year as was last year, and at least nine times as many men flew in 1910 as in 1909, yet the number of deaths through accidents is barely seven times as great.

FATAL AEROPLANE ACCIDENTS

Date	AVIATOR		WHERE FATALITY OCCURRED		AEROPLANE		Probable Cause of Accident
	Name	Nationality	Country	Place	Type	Make	
				1908			
Sept 17	Lieut. Thomas E. Selfridge	American	U. S. A.	(at Fort Myer, near Washington, D. C.).	Biplane	Wright	A
				1909			
Sept. 7	Ernest Lefebvre	French	France	(at the Juvisy-sur-Orge aerodrome, near Paris).	Biplane	French-built Wright	B or E
Sept. 22	Capt. Louis F. Ferber	French	France	(near Boulogne-sur-Mer).	Biplane	Voisin	D
Dec. 6	Antonio Fernandèz	Spanish	France	(at race-course, near Nice).	Biplane	Fernandès	A
				1910			
[illegible]	[illegible]	[illegible]	[illegible]	(at the [illegible] aerodrome, near Bordeaux).	[illegible]	Blériot	A

THE "MORNING POST," THE LARGEST DIRIGIBLE EVER BUILT IN FRANCE.

FOREIGN NEWS

BY

G. F. CAMPBELL WOOD

Argentine

Cattaneo, the daring Italian Blériot pilot, received a great reception in Argentine, where he made many brilliant flights. On November 5th he flew for two hours, passing over Buenos Ayres at a height of 2,000 metres.

England

A splendid flight was achieved on November 4th by S. F. Cody, who succeeded in staying aloft for 2 hours 24 minutes 30 seconds, and in covering 94 miles in his trial for the British Michelin Trophy. This remained an "All-British" record until November 26th, when Mr. Thomas Sopwith, on an E. N. V.-driven Howard Wright biplane flew at Brooklands for 3 hours 12 minutes 55 seconds, covering officially 107¼ miles in 3 hours 12 minutes 40 seconds; he thus leads for the "Cup." Sopwith's duration comes pretty close to Cattaneo's 3 hours 18 minutes 9 1-5 seconds at Lanark last August.

The crossing of the English Channel has long been looked upon as a standard for almost every form of aquatic and aerial locomotion.

Captain Webb swam across in 1875, and dozens have endeavored to imitate him since; others have rowed across in racing shells and crossed on all sorts of crude and unseaworthy craft, whilst since Blanchard and Jeffries crossed in a drifting balloon in 1785 many such trips have been made in both directions, and since Blériot flew across on July 25, 1909, J. de Lesseps, Rolls and Moisant have done likewise. But with all these passages of the famous "Sleeve," as the French call the narrow and shallow sea to which England has so far owed her "splendid isolation," none had ever been made in a motor-balloon—excepting, of course, that of the derelict "Patrie," which escaped from her crew, was seen next day drifting over Wales and Ireland and off the coast of Scotland and was of course never recovered.

It remained for the Clément-Bayard II. to be the first balloon to cross the Channel under her own power and the control of her crew. Leaving the shed at Lamotte-Breuil at 6:55 a. m., October 16, her land-hawsers were cast off at 7:08, and her engines set in motion at 7:10.

The trip to the great *"Daily Mail"* shed was uneventful, the balloon passing Montdidier at 7:48; Amiens, 8:20; Abbeville, 9:00; Rue, 9:21; Étaples, 9:48.30; Neufchatel, 10:00.2; Boulogne, 10:35; Folkestone, 11:20; Ashford, 11:44; Sevenoaks, 12:39; reaching London at 1; London Bridge at 1:10; landing at Wormwood at 1:36, and being housed in balloon-shed at 1:51.

The journey thus took 6 hrs. 16' of which 1 hr. 05' over the sea; the crew and passengers on this historical trip were M. Clément, the builder and owner; W. Ducros, the English delegate; Baudry, pilot; Sabatier, engineer; Leprince, second pilot; Dilasser and Daire, mechanicians—seven in all.

The "Clément Bayard II." was after all purchased by the English Government; apparently the French Government refused her; she is of 7,000 cubic metres and of 260-horse power.

A picture of this airship occurs on page 145 (June number) of this volume.

The first dirigible Channel-crossing had been history only ten days when the second took place: on October 26th, the great Lebaudy airship "Morning Post," built on the plans of M. Julliot and under the direction of M. Georges Juchmès, as a result of the subscription got up by the well-known London newspaper, the name of which it bears, made the trip from Moisson to Aldershot (230 miles) in five and a half hours. The "Morning Post" (103 metres long, 12.02 m. diameter, 10,000 cubic metres capacity) is the largest dirigible ever constructed in France and the largest semi-rigid dirigible in existence; it has two motors acting on two propellers of 5 metres diameter, and had only been up four times prior to this trip.

The crew consisted of Henri Julliot, designer; Louis Capazza, pilot; Léon Berthée, second pilot; Sir Alexander Banermann, director of the Military Aeronautic School of Aldershot; Mr. Allen, delegate of the *"Morning Post"*; Houtteville, Debrabant and Lucas.

The trip to Aldershot was made in a straight line, the dirigible crossing the Channel at a far broader point than the Clément-Bayard II., and taking two hours to go over the eighty miles of sea.

Leaving Moisson at 10 a. m., the "Morning Post" passed Héricourt at 10:13; Attilly, 10:18; Pavilleux, 10:21; Hennezis, 10:28; Vézillon (Andelys), 1,000 feet up, 10:31; Le Bue, 10:43; Flipou, 10:50; Boos, 10:56; Rouen cathedral, 11:05; Deville, 11:08; Maromme, 11:15; La Croix-Rompue, 11:18; Fresquienne, 11:24; Limesy, 11:30; Anzeville, 11:33; Yerville, 11:36; Galleville, 11:43; Ocqueville, 11:54; Ingouville, 11:58; the coast signal-station of St. Léger to the east of St. Valery-en-Caux (passed over sea), 12:03 p. m.; the English coast was in sight at 1:50, nearing Newhaven at 2; a turn was made to the west and the captive balloon at Brighton was passed over, as arranged, at 2:20; being over English soil, Sir Alexander Banermann took forward post to pick out route in the stead of M. Julliot; Billinghurst was passed at 2:30 and Aldershot reached at 3:30. There was difficulty in landing, owing to the wind, the final landing occurring at 4:05 p. m.

Yet another crossing of the English Channel by dirigible balloon took place on November 4th, this time from England to France and at night. Mr. Willows and Mr. V. K. Gooddens left Wormwood Scrubbs at 3:30 p. m. on their little 1,200 cubic metre 33 h. p. dirigible, "City of Cardiff"; they passed over the sea at 6:30 and had to rise over 3,000 feet to get clear of the fog and steer by the stars.

At 8:55 the "City of Cardiff" reached the French coast somewhere near St. Valery-on-the-Somme; they intended going to Issy-les-Moulineaux parade-ground, outside Paris, but had to land at Cordehem, near Douai, owing to motor troubles.

France

PARIS-BRUSSELS-PARIS

100,000, 50,000 and 20,000 francs were offered some months ago by the Automobile Club of France to the three aviators making the fastest round-trip, prior to December 31st, between Issy-les-Moulineaux parade-ground, near Paris, to the Exposition grounds at Etterbeek, near Brussels, a distance all told of some 350 miles, the maximum elapsed time allowed being thirty-six hours and the conditions calling for the carrying of a passenger, the total combined weight of aviator and passenger to be 150 kgs.—330.6 lbs.

The first two abortive attempts to win the prize, made on September 25th and 26th by Loridan and Mahieu, were referred to in the November AIRCRAFT.

Loridan and Fay did not get further than St. Quentin and Mahieu and de Manthé not beyond La Fère.

On October 16th Henri Wynmalen—at that time holder of the world's altitude record—left Issy for Brussels at 7:37'34" a. m. with Louis Dufour as a passenger. Their mount was a Gnôme-driven Henry Farman biplane. Wynmalen weighed 90.3 kils. and Dufour 67 kils.

They reached their first gasoline relay-station one hundred miles from Issy at 10:15, and left at 10:45 for the north; they crossed the frontier at noon, landed at 12:55 at Pont-à-Celles, near Brussels, left Pont-à-Celles at 1:05 p. m. and reached the Exposition grounds at 1:16'45"—5 hours 48'32" out from Issy, (if the 9'21" difference in time be considered).

Wynmalen and Dufour stayed but fifty minutes at Brussels and at 2:07 p. m. were off on the return journey; they flew for 2 hrs. 59' without a stop—a world's record for a two-man flight—landing in a state of exhaustion, at 5:06, at Moulin-lès-Tous-Vents near St. Quentin. They had covered over two hundred and sixty miles in less than nine and a half hours,—the greatest distance ever flown across country in a day.

The next morning (October 17th) at 6:40, Wynmalen and his passenger rose from the field at Moulin-lès-Tous-Vents—where their machine had spent the night under the care of the local firemen—and headed for Paris; it was not until 12:13'43" p. m., however, that the Issy grounds were reached, as owing to the fog and lack of gasoline, four landings had to be made, the last at the Longchamp race-course, almost within sight of the finish.

In this stage of the journey, Wynmalen narrowly escaped running into a factory-chimney, and got within dangerous proximity of a speeding express train and its vortex of displaced air.

The total time was 28 hrs. 36'09", but owing to the fact that the start was not given by an official time-keeper, the *Commission Sportive* of the Automobile Club de France decided that it could not credit Wynmalen with a time less than the maximum allowed, viz.: 36 hours. Wynmalen has protested against this decision and his club, the Aero Club of Holland, will take the matter before the Fédération Internationale.

On the same days as Wynmalen and Dufour made their wonderful international raid, Georges Legagneux, with his friend Martinet as a passenger, also attempted the great out-and-home flight. They left Issy—also on a Gnôme-driven Henry Farman—at 9:24'38" a. m., October 16th, landed near St. Quentin at 11:10 (at Moulin-les-Tous-Vents), left there at 11:25 for Brussels, which they reached at 2:22'14" p. m. (1 hr. 5'29" after Wynmalen's and Dufour's arrival and a quarter of an hour after their departure on the return-flight).

Legagneux decided to spend the night in Brussels; he and Martinet left for Paris at 6:20 a. m. (Greenwich time) next morning (about ten minutes before Wynmalen left Moulin-lès-Tous-Vents) and after one stop at Teigniers, arrived at St. Quentin, (where Wynmalen had spent the night) at 11:20; in starting off again they broke one side of the carrying-frame of their biplane and their propeller, when making a sharp turn to avoid two spectators, and had to give up; they still had until 9:24'38" p. m. to reach Issy.

On October 28th, Mahieu and de Manthé determined to try again and left Issy at 12:30 p. m.; they landed at Dravecy (Aisne) near La Fère, at 3 o'clock; leaving fifteen minutes later they passed Teigniers, crossed the frontier, but were compelled to land through darkness at Braine-le-Comte (not far from the field at Waterloo).

The next morning they left at 6:55 for the Etterbeek grounds which they reached twenty minutes later.

Motor trouble prevented their starting on the return journey.

On November 13th, Legagneux and Martinet made their second attempt; leaving Issy at 6:43'39" a. m. and helped along by a strong south-western wind, they reached Compiègne in fifty and one-half minutes, replenished their tanks and started on, ten minutes later (7:44). They made another ten minute stop at Ravay, crossed the frontier at 9 o'clock (2 hrs. 16'30" from Issy) and landed at the Exposition grounds at 10:10! With their two stops and ten minutes spent in finding their way near Le Cateau, Legagneux and Martinet had come through to Brussels from the south-western end of Paris in 3 hrs. 36' actual elapsed time—the fastest time ever made between the two cities, by any form of locomotion.

The next day the wind had increased to a gale and was blowing from the same quarter and Legagneux had once more to acknowledge himself beaten.

Yet another attempt for the Automobile Club prize was made on December 2d, by Loridan, who had been the first to try for the prize—last September. He, however, smashed his machine in starting and so was unable to proceed.

Wynmalen is thus the only contestant to have succeeded in fulfilling the conditions of the prize so far and, notwithstanding the decision of the A. C. F., stands a good chance to win it.

On December 9th, Georges Legagneux, the well-known and popular Frenchman went for the World's Altitude Record at Pau. He used a Gnôme-driven Blériot and reached a height of 3,200 metres (say 10,500 feet). Not only is this a world's record, but it is the first time a man has risen ten thousand feet in an aeroplane; he is not, however, the first to have reached the *three kilometre* (9,840 feet) mark, as the latest figures accepted for Drexel's flight of November 23rd, are 9,897 feet (3,020 metres).

Legagneux, besides being perhaps the most popular aviator in France, is the most versatile flyer in the world; no man has piloted so many different types of machines or change as easily from one to the other as he.

His first flight was on the Ferber biplane in 1908; since then he has driven Voisin, H. Farman, Sommer and Blériot machines indiscriminately.

A few weeks before his record-breaking flight on a Blériot, he made the wonderful passenger-carrying flight to Brussels on an H. Farman, related on the previous page, and the start of which is illustrated on the front cover. Legagneux is also the first man who ever flew in Austria (see page 217, this volume)

On November 27th, Laurens, carrying his wife as passenger, flew for 1 hr. 2' on the new two-seater Robert-Esnault-Pelterie monoplane.

He beat all Ladougne's and Aubrun's passenger-carrying records up to 80 kilometres, as follows:

Laurens' Times		Old Records	
10 kilom.	7'44"	Ladougne	8'14"2/5
20 "	15'39"	Aubrun	19'39"1/5
30 "	23'22"4/5	"	29'10"
40 "	31'09"3/5	"	38'51"
50 "	38'47"2/5	"	48'28"
60 "	46'23"1/5	"	57'58"2/5
70 "	54'01"	"	1 hr. 07'31"3/5
80 "	1 hr. 01'55"	"	1 hr. 16'59"2/5

On November 26th, Lieuts. Delage and Mailfois flew 130 miles across country in an out-and-home flight: they were up 3 hrs. 22': a world's record if made without a stop.

Mlle. Marvingt recently broke the world's duration record for women-flyers: she was up 53' on her Antoinette.

Mlle. Dutrieu has now got her pilot-license and will attempt to beat Mlle. Marvingt's record, for the cup offered by the magazine "Femina" for the best flight in 1910, by a woman.

Mr. Henry Farman, continuing his series of experiments in passenger and weight carrying, succeeded on November 11th in taking up four passengers beside himself on his special biplane. The total weight carried was 370 kilogs., made up as follows: Pilot, 67 kilogs.; passengers, 91, 65, 62 and 51 kilogs. respectively; gasoline, 22.5 kilogs., and oil, 10.5 kilogs. According to "L'Aérophile" he flew two laps on November 9th, carrying five passengers besides himself; this is a world's record for the number of people carried on an aeroplane. He had already flown 1 hr. 4' with three passengers besides himself last August: this is also a record.

Léon Morane, the great Blériot driver, who was recently injured in a fall, sustained while trying for the Michelin Grand Prize, had for some months previous to his accident been working on a machine of his own design. At its first trial it was timed to attain a speed of 62 miles an hour, with a 50 H. P. Gnôme.

A new type of Hanriot monoplane is being experimented with at Betheny; several satisfactory flights have been made with it at a height of 30 feet. The machine is fitted with two propellers, but in other respects differs little from the regular Hanriot type, a drawing of which appears in this number on page 400.

Continuing trials with his 20 H. P. monoplane Train has been steadily practicing at Mourmelon; on November 6th he flew for 1 hour 57 minutes at an average height of 1,400 feet, a record for a machine of this power.

The new Paulhan biplane described in detail in this issue has proved very successful at its first trials. On November 5th the machine was in the air altogether for an hour and a half.

Mr. Frantz Reichel, the well-known French newspaper-man, has compiled the following list of aviators' winnings from August, 1909, to the end of September, 1910:

	Francs.
Paulhan	410,262
Morane	264,899
Latham	262,160
Rougier	261,500
Chavez	246,367
Grahame-White	175,000
Leblanc	164,000
Farman	116,950
Legagneux	89,494
Van den Born	88,697
Dickson	86,146
Efimoff	83,558
Curtiss	83,000
Cattaneo	80,464
De Lambert	62,400
Aubrun	61,300
Brookins	57,000
Metrot	56,000
Wagner	55,270
Olieslaegers	51,000
Hamilton	50,000
Johnstone	47,500
Simon	46,650
Blériot	42,000
Drexel	42,000
Thomas	27,900
N. Kinet	27,725
Dubonnet	27,571
Martinet	25,400
Tissandier	24,900
Hanriot	22,977
Audemars	21,971
Kuller	20,748
Mamet	20,000
Duray	19,540
Christiaens	18,789
Illner	17,200
Paillette	17,147
Le Blon	17,000
Fischer	17,000
Labouchère	16,700
Weymann	16,300
Crochon	16,000
Popoff	15,500
J. de Lesseps	13,500
Renaux	13,000
A. Frey	11,600
Balsan	11,500
McArdle	11,250
Brégi	10,700
Bielovuccic	10,150
Jullerot	10,000
Tyck	10,000

Won more than 5,000 francs: Rolls, 8,541; Gobron, 6,700; Molon, 600; Morelli, 5,500; Wieneziers, 7,500; Horwarth, 7,875; Warchalowski, 7,350; Engelhardt, 5,670; A. Frey, 8,750; Grau 7,500; Ruggerone, 6,000.

Won less than 5,000 francs: de Baeder, Baratoux, Bréguet, 143 fr.; Champel, Chassagne, Château, Cheuret, Commander Clolus, Captain Burgeat Lelagrange, 700; Demanest, Dufour Dulier, Captain Ferber, 200; Gibert, Grade, Ladougne, Raymonde de Laroche, 169; Lefebvre, Lindpaintner, Nieuport, Paul, de Petrowsky, Rawlinson, Rigal, de Riemsdyk, Sands, Santos-Dumont, 1,500; Tétard, Verstraeten, Wachter, Wiesenbach, Szelkely, Railley, Gilmont, Cagno, Caltet, etc.

Germany

A cross-country flight from Vienna to Berlin is being thought of for next season, open only to German and Austrian aviators. Another important event in the Aix la Chapelle to Berlin contest via Cologne, Düsseldorf, Dortmund, Hanover, Brunswick and Magdeburg, winding up at the Johannisthal aviation ground.

A commission consisting of three Dutch officers paid a visit to the German Wright works at Berlin-Adlershof last month and were taken up by Captain Englehardt for trial trips. They also went to Johannisthal on their tour of inspection.

A new duration record for Germany has been set up by Euler, who flew at Darmstadt for three hours six minutes eighteen seconds on a Euler biplane; the former record was two hours forty minutes. Herr Euler was officially timed.

The Bork-Johannisthal cross-country competition only secured the attention of three aviators: Wieneziers (Blériot), Grade (Grade), and Thelen (Wright). They all did well, however, and carefully kept to the route marked out for them. Wieneziers carried off the first prize in 41 minutes 10 seconds, Grade being second, 53 minutes 40 seconds, and Thelen third, 56 minutes 15 seconds.

The German Government has purchased the following aeroplanes: Wright, Aviatik, Sommer-Albatros and Farman-Albatros. In addition to these the War Ministry, after a careful study of all existing types, has purchased twenty Etrich monoplanes in Vienna, and Illner has gone to Berlin to instruct the officers chosen to pilot them. (The Etrich monoplane was fully described and illustrated in the November AIRCRAFT, page 325). The German War Office has also placed an order for a new Zeppelin army-dirigible; nothing has been announced as yet concerning the conditions set by the Ministry. The Dusseldorf Aerial Navigation Company, for whom "Deutschland II" is being built, is in negotiations for another airship.

German aviators are to introduce flying on an extensive scale into South America, as the German Aviation Company of Frankfort has arranged a tour with its Brazilian representatives. Herr Schultze-Herfort will undertake the technical work and be accompanied by a number of good aviators.

An Aviation Show is to be held at Berlin in 1911, support having been promised by German, French and English makers.

Major-General von Oppeda made a lengthy flight with Amerigo, at Mulhausen, last week, flying for about eight miles on his "Aviatik" machine.

The German War Office has signed on Brunhuber, the Munich aviator, as military instructor; his contract runs from January 1st. Brunhuber has already acted in a like capacity to the officers learning at Doeberitz, in this case as a representative of the Albatros firm. He has now been wholly taken on by the military officials. Prince Henry of Prussia is busily engaged in learning to fly on a Euler machine at Darmstadt; he has carried out several flights of a mile or two. Being a most able motorist, he soon learned to control the machine. Princess Henry has been an interested witness of her husband's prowess, and has ascended for a fifteen mile flight with Herr Euler.

Prince Henry passed his pilot examination before the official German commission for the district.

Germany is very industrious in arranging aerial cross-country flights, two being now under consideration. The one will take place on the Friedrichshafen-Ulm route for a prize of 25,000 marks, presented by Count Zeppelin. The other, far

BIELOVUCCIC'S HEADLESS VOISIN BIPLANE. (THE VOISINS ARE THE ONLY IMPORTANT FIRM NOW USING METAL PROPELLERS).

more important, is to lead from Berlin to Hamburg and Hanover and back to the metropolis. The meeting at which the project was discussed was called by the Imperial Aero Club, the Automobile Club and the German Manufacturers' Society, several Government representatives being present. The nationality of the pilot has not yet been decided, but it is a certainty that the aeroplanes and motors will have to be of German manufacture down to the slightest detail.

Italy

We have been asked to publish the full results of the Milan meeting (September); they were as follows:

SPEED (100 KILOMETRES).

1.	Cattaneo (Blériot)	1 hr. 8' 5 3-5"
2.	Simon (Blériot)	1 hr. 9' 16"
3.	Wienczíers (Blériot)	1 hr. 12' 42"

ALTITUDE.

1.	Legagneux (Blériot)	2.050 m.
2.	Cattaneo (Blériot)	1.600 m.
3.	Tyck (Blériot)	900 m.
4.	Wiencziers (Blériot)	870 m.
5.	Brégi (Voisin)	610 m.
6.	Weymann (H. Farman)	390 m.

GLIDING (Vol Plané).

1.	Biélovuccic (Voisin)	34 1-5"
2.	Brégi (Voisin)	25 4-5"
3.	Weymann (H. Farman)	23 3-5"

TOTALIZATION OF DISTANCE.

1.	Fischer (H. Farman)	1,222	kilometres
2.	Ruggerone (M. Farman)	1,156	"
3.	Cattaneo (Blériot)	901	"
4.	Thomas (Antoinette)	792	"
5.	Cagno (H. Farman)	496	"
6.	Brégi (Voisin)	392	"
7.	Kuller (Antoinette)	318	"
8	Simon (Blériot)	274	"
9.	Cailler (Paulhan)	250	"
10.	Legagneux (Blériot)	211	"
11.	Wiencziers (Blériot)	155	"
12.	Tétard (Sommer)	146	"
13.	De Robillard (Antoinette)	119	"
14.	Weymann (H. Farman)	108	"
15.	Dickson (H. Farman)	92	"
16.	Tyck (Blériot)	91	"
17.	Biélovuccic (Voisin)	88	"
18.	Aubrun (Blériot)	54	"
19.	Barra (M. Farman)	33	"
20.	Cheuret (H. Farman)	26	"
21.	Paulhan (Paulhan)	19	"
22.	Métrot (Voisin)	14	"
23.	Audemars (Demoiselle)	11	"
24.	Paul (Voisin)	9	"
25.	Paillette (Blériot)	5	"

National Speed Prize	Cattaneo (Blériot)
Non-Stop Distance Prize	Cattaneo (Blériot)
Minister of Navy Prize	Ruggerone (M. Farman)
Post and Telegraph Prize	Cagno (H. Farman)

Mechanicians Prize—

1.	Fischer	1,000
2.	Cattaneo	500
3.	Legagneux	500
4.	Cagno	500

PRIZES—MONEY WON.

Cattaneo (Blériot)	28,700	Frs.
Fischer (H. Farman)	11,400	"
Legagneux (Blériot)	10,000	"
Simon (Blériot)	8,500	"
Ruggerone (M. Farman)	6,000	"
Thomas (Antoinette)	4,600	"
Weymann (H. Farman)	3,800	"
Aubrun (Blériot)	3,500	"
Wiencziers (Blériot)	3,500	"
Cagno (H. Farman)	2,500	"
Biélovuccic (Voisin)	2,300	"
Brégi (Voisin)	2,300	"
Tyck (Blériot)	2,000	"
Cailler (Paulhan)	500	"
Tétard (Sommer)	400	"
Audemars (Demoiselle)	200	"

Japan

The Japanese Government has purchased a two-seater Blériot and two officers are being taught to handle it in France.

FEATURES OF THE PARIS SHOW

(Continued from December)

From "The Aero," London

LOUIS BLERIOT.

The place of honor immediately next the entrance has been rightly alloted to M. Blériot, who shows four machines on his own stand, besides three others shown by various agents. Those on the stand comprise a side-by-side two-seater of 50 h. p.; a 50 h. p. Gnôme racer; a 25 h. p. Grégoire-Gyp single-seater; and the actual 50 h. p. Gnôme-Blériot used by Leblanc in the Circuit de l'Est. Those with the Gnôme engines are very similar to the many Blériots already familiar on all aerodromes, and in the one with the Gyp engine the only novelty is the method of fitting the engine-bearers into the *fuselage*, for these Gyp engines are all inverted—that is to say, the cylinders are below the shaft, so as to keep the centre of gravity low, and the crank-shaft as high as possible. The resultant job in the Blériot is extremely neat, and the Gyp-Blériot as a cheaper machine than the Gnôme-Blériot, should be a very popular mount.

The only constructional difference in the latest Blériots is the substitution of cane skids for the old trailing wheel under the tail, which wheel was always giving trouble and causing accidents. The cane skids are lighter, cheaper, and in every way better. They were first used in the Circuit de l'Est.

A notable point is that not a single machine on the stand is shown with an Anzani engine.

ANDRE NOEL.

M. Noël shows a pretty little monoplane very like an enlarged Nieuport. This is built by M. Chassany in collaboration with M. Labanhie, and the wings are built under Nieuport license. The single-skid-and-pair-of wheels *chassis* is used, but in this case the axle is held by radius-rods to the front of the *fuselage*, and by springs to the skid—a very neat and simple method. The three-cylinder Viale engine is held just as in the Nieuport, the only other noticeable point of difference being the rudder, a quadrilateral affair, with a blunt leading angle and an acute trailing angle.

ETABLISSEMENTS "AUTOPLAN."

Here is shown the "De Pischof" monoplane, a machine which caused quite a sensation at the Reims Meeting. It is, one believes, the only successful monoplane with a single propeller immediately behind the main planes. The arrangement is clever and simple. The *fuselage*, or the frame which does duty for it, practically takes in the whole machine. The two lower longitudinal members start as skids and continue back parallel to each other, becoming the two lower tail-struts. At their ends they are jointed to the upper longitudinals. These converge till they meet at a point a little behind the edge of the main plane, which is about seven feet off the ground. Here they meet in a steel joint.

This joint is fitted on to a shaft on which is mounted the propeller, the forward end of the shaft fitting on to a steel tubular arrangement which connects to the uprights, just like those of a biplane, which couple the plane to the skids. On the skids and under the plane is built a platform, which carries the engine in front, and behind it are the seats for the driver and pilot, the whole arrangement being almost the same as in an automobile, the likeness to which is heightened by the position of the radiator and engine and the fitting of a clutch and starting handle. The engine-shaft is carried back under the seats, behind which is a chain driving up to the propeller.

The plane itself has upwardly titled tips, and these are warped to get lateral control. A Blériot pattern tail is used, with little elevator planes at each end. On top of it are twin rudders, and above them again is a flat *empennage*. The whole machine really seems a development of the Blériot XII, but it is full of original ideas. The great objection to it is, and must always be, the very low centre of gravity. This, however, might be got over by making it into a biplane—by fitting small planes on each side of the engine. To prevent swinging, due to the low centre, the *chassis* has vertical panels set into it. The landing arrangements are a pair of wheels à la Sommer on a trussed axle and a pair of supplementary spring skids at the toes of the main skids. The wings are easily dismounted for transport by land, the outer sections coming away bodily. In many ways the machine is one of the most interesting of the new makes.

SOCIETE ASTRA.

The big Astra Company show a machine "under Wright license," either from a love of peace or from more deeply diplomatic motives, for excepting the fact that the wings are warped and the uprights attached à la Wright, there is not the least resemblance. In fact the briefest description of the machine could be to call it a pair of Wright planes mounted on a Farman *chassis*, with a Voisin *fuselage*, a pair of Blériot elevators minus the fixed tail plane, and a pair of Antoinette rudders above and below them. The only threat of originality about the machine is the fitting of two seats, tandem-fashion, both having a control-wheel, so that the pupil can follow the instructor's movements. As might be expected from such a firm, the workmanship and finish are excellent, but certainly there has never yet appeared a machine combining so many of the points of other machines. Unfortunately they are not all the best points which have been appropriated, though certainly the machine should fly quite well.

COMPAGNIE GENERALE DE NAVIGATION AERIENNE.

The Wright *concessionnaires* show a Wright which is to the casual eye as all other Wrights are. However, a very important alteration has been made in the arrangement of the struts which hold the rear elevator. There are now two good stout struts starting from the upper plane and two from the lower one, one from each plane converging and meeting an upright further aft than the rudder. These uprights are connected by a horizontal bar, which looks too light, and on them is carried the tail plane, which is warped in the same way as are the front elevators. The twin rudders are still carried on horizontal struts, presumably to allow the rudder to be pushed upwards if the lower strut strikes the ground on landing, which was one of the original "talking points" of the Wright. However, the six struts and the wooden control-bar of about the same thickness give a very clumsy look to the back of the machine.

The skids now carry each a pair of tiny wheels to allow of starting without a rail. These wheels are apparently built from sheet metal pressings, and are fitted close up to the sides of the skid without any arrangement for swivelling, the idea of the close fitting apparently being to prevent buckling of the wheels if the machine lands sideways, for the rim of one wheel of each pair would bear against the side of the skid in such a case. The little short axles are carried on metal springs, but the whole arrangement is obviously not as neat as the "trip" gear fitted by Mr. Alec Ogilvie to his Wright machine.

There is also a pair of even smaller wheels fitted on a trailing swivel to the centre of a crossbar between the skids nearly under the elevator in order to help the machine to run along the ground if it lands down by the head or if it strikes a small rise on the ground. Otherwise the machine is to all intents and purposes the same as the machine on which Wilbur Wright flew in France in 1908.

EUGENE GANGLER.

The Gangler monoplane is again shown, but only in a slightly more advanced stage than last year. It is, however, interesting as being the only monoplane in which there are two propellers placed one on each side of the *fuselage* and behind the wings. The pilot sits right in the bows. The wings are curved into a kind of bird-shape. It has a cruciform *empennage*, the horizontal portion being prolonged so that the triangular rudders work above and below it, clear of the elevator-flap, which is aft of everything. The machine is apparently waiting for an engine.

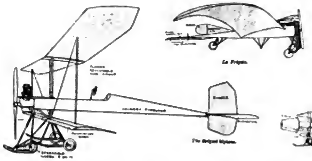
S. V. A.

The Société des Véhicules Aériens show the "Simplex" monoplane, so-called on the *lucus à non lucendo* principle, it being by far the most complicated machine in the show! The main plane and front part of the *fuselage* are conventional enough, though the pilot sits below the floor, but towards the tail the *fuselage* flattens out, and where it joins the tail it is wide laterally and quite thin vertically. Just in front of the tail are two little elevators—surely a bad position—and above it is the rudder, which is preceded by a tiny vertical *empennage*. The *chassis* is far too complicated a thing for any verbal description, and it must be left to the talent of our artist to make it understandable. One good point about it, however, is the skids, which are spread very far apart and are curved diagonally towards the centre of the machine, so as to fetch it up vertical if it lands sideways. It may be remembered that Mr. Gordon Stewart had a somewhat similar idea in the tail-skid of the Mulliner monoplane at Olympia.

On the same stand is a tiny monoplane of

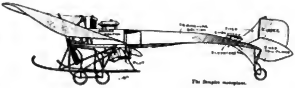
LATEST TYPES OF FRENCH AIR-CRAFT

Continued from Page 366 (December)



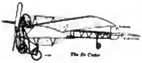
The Bréguet biplane.

La Frégate.



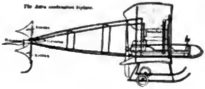
The Simplex monoplane.

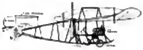
The Caudron "all wood" biplane.



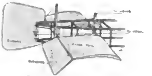
The De Caters

The Astra construction biplane.

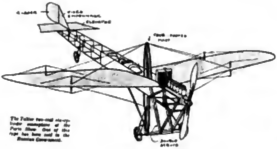




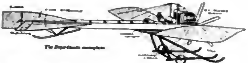
The De Pischof aero car.



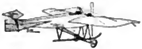
The variable tail of the [illegible] monoplane.



The Tellier two-seat six-cylinder monoplane at the Paris Show. One of this type has been sold to the Russian Government.



The Deperdussin monoplane.



The [illegible] monoplane.

The Paulhan Biplane

Construction Details

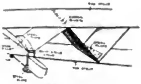


Fig. 1.—Construction of main spars.

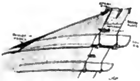


Fig. 2.—Rib attachment viewed from below.

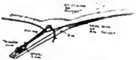


Fig. 3.—Attachment of rear edge of fabric.

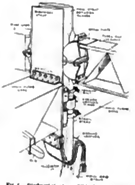


Fig. 4.—Attachment of outer "cell" to chassis and fuselage.

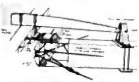


Fig. 5.—Hinged attachment of adjustable tail.

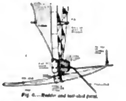


Fig. 6.—Rudder and tail-skid joint.

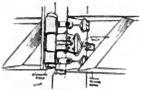


Fig. 7.—Side cell attachment.

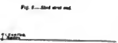


Fig. 8.—Skid strut end.

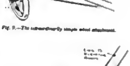
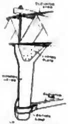


Fig. 9.—The extraordinarily simple wheel attachment.



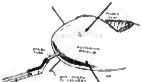


Fig. 13.—"Carrosserie" and controls.

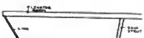


Fig. 10.—General arrangement of skid and chassis.

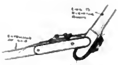


Fig. 11.—Skid and [illegible] joint.

Fig. 12.—Elevator lever.

Taken from Drawings of "The Aero," London.

There is this to be said on behalf of conducting such an affair upon business principles. Flying is still so novel that experienced flyers will not assemble unless large prizes of money are forthcoming. This burden, and the heavy operating costs of a meet, make it necessary that a large fund be provided or underwritten. It being impossible to secure by gift more than a small portion of the money required, the financing of such an event resolves itself into the questions of making expenditure come within funds in hand, and of seeing that gate receipts and concessions cover cost. Up to this point, if interesting meets are to be held at all, the balance sheet must be kept clearly in view; but to carry flying out of the category of a self-supporting sport into that of a moneymaking enterprise is to lessen its dignity by lowering its tone, and thus drive out of it the class of sportsmen who spend money on their pleasures, but refuse to profit by them.

From an engineering standpoint the Gnôme engine was the most striking success of the Belmont Fly. Simple, light, compact, and unfailing, this little motor may be said to have pointed the way along which solutions of the power question are to be found. With the Wright "baby" racer held up in midair by an engine gone dead, and Hamilton's machine unable to start—both in America's critical hour—to say nothing of Ogilvie's Wright on the ground for repairs, that diminutive, waterless, pocketful of power, well called the Gnôme, played its part with never a hitch, and gave to the only other nations that competed the Gordon Bennett honors. And for the difficult and dangerous Statue of Liberty flight—which inexorably called for certainty of continuous performance—no other motor so much as left the ground. It is the writer's belief that American engineers should abandon at once their efforts to apply the power plant of the motor car to the work of flying. Let them master the principles so admirably expressed in the Gnôme engine, and put them to better use if they can. Its constructors, alone among all other designers, seem unerringly to have sensed the precise needs of flight. By having made of their cylinders the rotor weight is lessened, while each cylinder, unshielded by its neighbor, not only is thrust but is laterally whirled as well, through an oncoming cooling bath of air. Thus much weight and a lot of space are saved, and any need for cooling water, with its complicated and troublesome plant, is wholly absent. It should be borne in mind that the normal speed of flight is at present between 40 and 60 miles an hour and is rapidly increasing, and that one is usually far enough from the ground to escape the reflected heat of sun-baked road or field, which the motor-car must suffer. Also, that an airplane is usually driven at a constant speed and its engine not subjected to the heat variations to which the six-to-sixty-miles-an-hour of the motorist subjects his power plant. All are advantages in favor of the flight engine; therefore much that is necessary to the engine of the road can be eliminated. This the inventors of the Gnôme saw and carried into practice, while we Yankees have been unable to break with tradition.

Another superiority we must yield the French lies in the quality of the general construction of their airplanes. At Belmont the exquisite workmanship of Antoinette and Blériot made the native machine look painfully home-made. The French seem to have called to their aid highly trained wood, metal, and fabric workers, while the American jack-of-all-trades—clever and handy but unskilled—apparently made every part of his own machine and clapped them all together by sheer force of intention. The features of specialization and the lack of it were characteristically illustrated throughout the meet. During preparations for one of the events the writer found Hoxsey grinding his own valves, Hamilton toting water for his radiator and Latham.... changing his gloves. There is this to be said, however, for the Yankee man-of-all-work idea; no American ran out of gasoline aloft, while two Frenchmen grounded in important events—one, Leblanc, in the Gordon Bennett, thereby losing the Cup—solely because they had unwisely relied upon their mechanicians to see that their tanks were full! It was, however, the English airmen who settled upon the best method; their mechanics did the work and they—the flying, usually only after a thoroughgoing personal inspection.

In another respect, aside from that of power, may the hand of the French now be seen selecting the principles which seem destined to govern the future development of form. The early days of the automobile come pointedly to mind. While here we were blindly hitching an engine any old where—in, under, or behind a cart, the French calmly put it where the horse had stood—and forever settled the question of motor car form. The airplane, similarly, is undergoing modification. In abandoning all head control and placing aft their elevator, the French seem again to have pointed in the right direction. That this is so both of our native schools admit. The Wrights already have lengthened their tail and set their elevator aft, while Curtiss, in his racing monoplane-and-a-half—shown but not used at Belmont Park—had so constructed it that its elevator, set as usual ahead, could instantly be removed and another, aft, employed instead. The Wright principle of warping seems, on the other hand, to have become firmly fixed in French practice, while independent stablizers, in the form of hinged auxiliary wings, appear gradually to be passing from use. Fear of the Wright patent, perhaps, is the only remaining local reason for their retention. In thus exchanging salient features, the leading types of both nations are coming to possess more of a common resemblance than is generally supposed to exist. When seen from beneath at a great height it was difficult for the writer to distinguish the "light roadster" Wright from a Blériot that was near it.

Reductions of transverse spread, of plane width, and of inter-plane space seem greatly to have improved the speed quality, as well as the appearance, of the Wright machine. But Brookins' disastrous glide, and some peculiarities of behavior of Ogilvie's "light roadster," would indicate that in their new small headless model the Wrights have not as yet placed their weights to the best advantage. Were driver and engine set a bit further aft, it would appear to be easier than it is to keep these little Wrights head-up. Still, this is merely a detail.

If the Gnôme engine furnished the Americans with a sensation, no less did the miniature headless Wrights startle the French. Those who stood among the foreign flyers during that early morning trial spin of Orville Wright, in his "baby grand," can testify to its effects upon their spirits and hopes. As one of them said, they felt that the masters once more had spoken—and they had. As the lumbering stage-coach of the air the Wright machine had been safely dismissed from the minds of the flyers who were here for the Gordon Bennett—when suddenly that queer-looking, hurrying, insect-like infant shot out of a Wright tent into the air, and every calculation instantly went by the board. How tenderly thereafter the little thing was nursed. When, the evening before the race, a heavy wind put the tents in jeopardy, how gently and cautiously it was trundled out between gusts and snugly stowed for the night in one of the wooden sheds. Next day it came home, a snarl of wire and splinters—and the Gnôme-driven Blériot had its way. But this is beside the point, which is that this reassertion of their claim to supremacy by the Wrights served but to emphasize the profound admiration in which they are held by the French.

When it came to wind work the Wrights and Latham were freely granted a monopoly of the air by all other participants in the fly. Then Blériot, Curtiss, and Farman hugged the ground. The mention of wind brings up for discussion the two remaining vulnerable points, of the first class, of the air plane. All modern machines, in greater or less degree, are in danger when flanked by the wind. It is then that the plane driver must supply with his skill what the machine itself lacks of autostability. While Johnstone and Hoxsey proved that a steady wind, even of 60 to 70 miles velocity, can easily be dealt with, the fact remains that no machine flown at Belmont was gust-proof. And it is the gust-proof machine that we must have before amateurs with family connections can comfortably take to wing. In the urgent desire for a swift, sure, and easy dead-ahead performance, lateral aspect seems to have been neglected; and it is largely with this that search for gust-proof principles must concern itself. Directly bearing upon this is the subject of materials. It may be thought too forehanded to say that wood and woven fabric must go, but the writer is not without reason for his belief that the all-metal machine is a thing almost of the immediate future. Even the further assurance of safety to be got through a construction that is fireproof will be no small gain. A gasoline fire high in the air aboard a rushing thing of wood and canvas is not beyond the normal possibilities of present day flight. More power and the cooperation of the skilled metallurgist will shortly, however, rid the infant, Airplane, of his swaddling clothes. Then, even that "dear old lady," of whom everybody seems in search, may at last be found enjoying herself aloft—possibly over Philadelphia.

To turn now from the machinery of flying to the philosophy of flight. What changes are to come of this, our new faculty? From the beginnings of the race we have lived on the flat. True, we have climbed above ground, and burrowed beneath it; and occasionally have floated away on a bubble of gas—but never till now have we commanded the third dimension of space. No previous race movement can be compared with this in kind, nor, it is the writer's belief, in the profound changes which, perhaps too silently for easy observation, it already has begun to inaugurate. The very nature and strength of the hope of easier and more interesting conditions of life, as well as the prospect that we are about to enter upon a stirring drama of titanic proportions—wholly aside from the actual realization of either—are huge assets. Indeed, were there suddenly to be subtracted from our daily thought its latest possession, the knowledge that at last we fly, how dejected and dull we should return to labor. While the added courage it has given man in the battle for mastery he is waging with surrounding Nature, is an immense strengthening of the world's arm. And these are but the spiritual gains of flight.

Finally, we come to the question of the hour: What of the sport? No other for a moment seems comparable with flying. Daring and skill nowhere else are so tauntingly challenged. In other sports men bet their time, or their money, or sometimes their bones; in this they wager their lives. To the elements of chance and skill flying adds that of danger, and thus arouses the primal instincts of sportsmanship. The pictures that come to mind, of Latham in a desperate dive of three thousand feet; of Hoxsey and Johnstone passing sternwise from view in a sixty-five mile blow; of the projectile-like nineteen laps of Leblanc, which ended so disastrously, and the boyish Drexel, continually plugging away out of sight to fetch that ten thousandth foot of height poor Johnstone almost got, recall events that for breathless interest cannot be paralleled in any other sport. While that mad across-roof flight to Liberty and back, of three aerial dare-devils—their respective finishes varying only by seconds, mind you—furnished a climax that must have stirred to life a Roman charioteer, had his mummy been at the track. On behalf of the beauty of the sport but a single memory need be given; the westerly mark—gaunt, towerlike—is silhouetted against the sky at sunset, while between them, turning and banked against the glow, gracefully sweeps Latham, philosopher and aristocrat, in his superb Antoinette machine.

MODEL CONSTRUCTION DETAILS

By W. H. Phipps

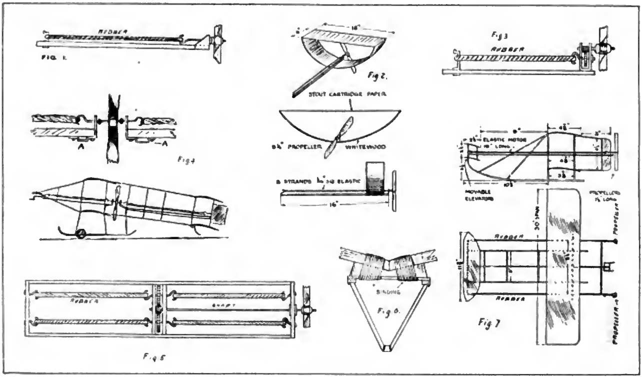


FIG. 1—Illustrates a simple elastic motor. It consists of a long stick with a rigid hook at one end and a bearing for the propeller at the other end. The bearing-block is made from a small piece of wood cut to the design shown, through which a hole is drilled for the shaft. Two small beads act as thrust-bearings and the propeller can be attached in any suitable manner. The simplest method is to bend the shaft over and into the propeller hub so as to prevent its slipping.

FIG. 2—Shows a simple and ingenious model which flies without any rudder. The main underplane can be made from a thin strip of white wood or built of bamboo strips and wood and covered with light China silk. The dimensions and shape of the model are clearly outlined in the sketch.

Fig. 3—Shows a simple method of constructing a geared rubber motor with a gear ratio of four to one.

Fig. 4—Is a suggestion for fitting a rubber motor to a Farman type model. It could be so attached as to permit of winding at either end of machine.

Fig. 5—Illustrates a more complicated type of geared motor in which the twisting of the motor frame is eliminated by the use of two sets of rubber winding in opposite directions.

Fig. 6—Shows a simple method of attaching the wings of an Antoinette type of model to the frame at a dihedral angle.

Fig. 7—Illustrates a Wright type of flyer fitted with two propellers revolving in opposite directions. The frame for the planes, skids and rudders can be made up of either small sticks or split bamboo. The latter is preferable as it will stand considerably more strain than the wood. Good flexible joints can be made by simply wrapping with thread and then gluing.

The propellers are the hardest part to make and great care should be taken in shaping them as the success of the model depends to a great extent upon them.

NEWS IN GENERAL

At Overland Park, near Denver, Ralph Johnstone, holder of the world's altitude record, was killed on November 17th, when his Wright biplane got out of control at a height of about 500 feet and crashed to earth.

His is the second aeroplane fatality to occur in America (the first being the accident which on September 17, 1908, resulted in the death of Orville Wright's passenger, Lieutenant Selfridge), and is the first death of a *pilot* of a power-driven heavier-than-air craft so far recorded to the West of the Atlantic (see this month's Records and Statistics).

Many previous aeroplane accidents have received contradictory explanations, but none has so far occurred of which the actual cause was so enshrouded in mystery as this one.

The proper answer to any enquiry as to what caused Johnstone's biplane to fall is that no one exactly knows what it was; various explanations have been put forward; many aver that Johnstone merely lost control of his machine through taking too sharp a turn and that he could not with safety execute in the thin air of Denver—which is a mile above sea-level—his spiral descents.

This explanation can safely be disposed of: the "thin air" could have nothing whatever to do with the accident, while, at the height he was above ground, and with his machine sound, it is inadmissible Johnstone could not recover any lost balance long before earth was reached.

The most natural explanation and that which would at first occur to a reader of the reports of the fatality, is that while Johnstone was executing one of his spiral descents, one of the bracing-and-warping wires broke under the tremendous extra strain imposed by such a manoeuvre (it must be about three times that sustained in normal flight), causing the collapse of one side of the machine.

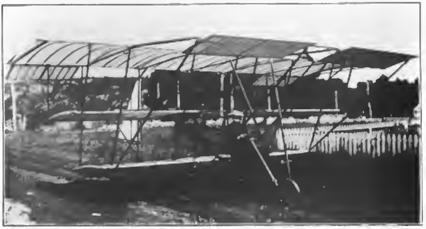
The opinion of the other Wright flyers at Denver was naturally the most valuable to obtain; Hoxsey never saw Johnstone fall; he was flying at the time and did not realize anything untoward had happened until he noticed the commotion below; Brookins, however, was watching his partners flying and noticed that part of Johnstone's left lower plane near the rear and the centre was puffed up as if loose: Johnstone was making fairly wide sweeps or spirals and this was the side of the biplane undergoing the least pressure at the time. Then Johnstone did something the why and wherefore of which will never be definitely known; he deliberately tossed off his helmet and goggles and *left his seat*, crawling to the rear of the plane.

That something happened—something of the most vital ominousness—to compel Johnstone to act as he did, is only too plain. Under the stress of the realization of a mortal peril he cast off the only life-saving device he wore—his helmet—and let go of the thing on which more than on anything else his life depended in normal flight—his elevator-lever. It has been said that he did so because his warping mechanism had become useless and that "gripping the planes with his hands, he tried to control the warping by sheer strength."

A better explanation would be that the warping had in some way become jammed or blocked retaining one side warped down and the other up, which might well drive Johnstone helplessly in a spiral to the ground, unless he straightened matters out at the pulley or at whatever spot the trouble had occurred. Were his wings straight and the warping mechanism merely paralyzed, the risk incurred would hardly have warranted his leaving his post of control, as with his engine going he could almost certainly have landed with but little damage.

Two other hypotheses have been suggested, the one is that the elevator-wires broke and that Johnstone went to the rear of his seat to try and work what remained of the wires with his hands; these wires have such a reserve of strength, however, that if it were established that this occurred one could not be taxed with an unnatural or over-sensational suspicion if he believed them to have been tampered with (as is said to have occurred once or twice abroad); the other hypothesis is based on the accident which happened to Johnstone the previous day: in alighting he had damaged his left wing against a fence and the repair had been made over night; it is just possible that in putting the sections together the connecting cotter-pin may have been omitted or badly secured, and the ensuing behavior of the wing may well have accounted for the deformity noticed by Brookins, whilst Johnstone's leaving his seat may be explained by his desire to avoid being under the motor in the fall.

Whatever the cause of the fatality—and because of the condition of the machine after the fall and after the ghoulish crowd of curio-hunters had despoiled it, it will always be a matter of pure conjecture—the world lost in Johnstone an aviator of great ability and a man of most unusual personality; it can be truly said of him that his every acquaintance was a friend.



TRIPLANE BUILT BY STEBBINS AND GEYNET OF NORWICH, CONN., WITH A DETACHABLE MIDDLE PLANE.

J. Armstrong Drexel and Claude Grahame-White made a fine series of flights at Philadelphia from November 19th to 24th. Among the passengers taken up by Grahame-White, on his H. Farman biplane, were Miss Ridgway, Miss Sears, Professor Samuel A. King, General Allen, H. W. Gill, Wayne and McDonald, his manager.

On November 23rd, Drexel started out for altitude; he wore a special fleece-lined canvas suit and several sweaters, so as to successfully cope with the bitter cold of the upper regions.

After a flight of over an hour he landed near Oreland, some twelve miles from Philadelphia.

The barographic reading gave at first sight 9,970 feet, as against Johnstone's world's figures of 9,714 feet.

The instrument was sent to New York and calibrated by Schneider Bros., whose verdict was 9,450 feet; it was then returned to Philadelphia for examination by government experts, the final figures quoted being 9,897 feet.

The calibration should naturally have been made *before* the event, when a simple calculation would have given the result accurately and expeditiously.

After every railroad journey by such a delicate instrument, a new calibration is, of course, necessary and the barograph should never have been shipped away for examination.

One cannot help feeling sorry for Drexel, who no doubt broke the world's record, but whose great performance will always be open to question owing to the amateurish manner in which its checking was handled: the heights at Belmont Park were ascertained with unquestionable accuracy: the methods used there should be followed everywhere.

The height reached by Drexel has since been exceeded in France, by Legagneux (see Foreign News).

OCTAVE CHANUTE, the "father of the modern aeroplane," died in Chicago on November 23rd, in his seventy-third year.

He had been ailing for some months and was ill when he passed through New York last October on his way back from Paris.

Nothing too good can be said of this great pioneer, whose reputation is perhaps even greater in the land of his birth—France—than in that of his adoption.

What Chanute has done for aviation has already been related in this magazine (page 23 of this volume): with him disappears one of the greatest figures of the first days of flying.

It may be interesting to note that out of the thousands of readers of Aircraft, Mr. Chanute was twelfth on its list of subscribers.

Aircraft published last month the approximate distances covered in the Gordon Bennett Balloon Cup race; the official figures have since come to hand; they are as follows:

America II (United States)..........	1,172.9	miles
Dusseldorf (Germany)..............	1,127.5	"
Germania (Germany)..............	1,068.8	miles
Helvetia (Switzerland)............	826	"
Harburg III (Germany)..........	758.4	"
Azurea (Switzerland)............	747.9	"
Isle de France (France)............	718.7	"
St. Louis IV (United States).......	551.3	"
Condor (France)..................	408.2	"
Million Population Club (U. S.).....	316.3	"

Thus the Comte de la Vaulx's world's record (1,193½ miles) remains unbeaten after all. Messrs. Hawley and Post are certainly deserving of commiseration in this regard, after their splendid effort and the generally accepted unofficial announcement that the record was theirs. On the other hand, full reparation should be made by all to de la Vaulx for so hastily proclaiming the passing of his great record, the tenth anniversary of which has just been feted in Paris.

The idea that de la Vaulx's distance may not have been correctly measured is, of course, preposterous: it is just as official as any other record passed on by the Aero Club of France.

Notification has been received from Chester I. Campbell, who last February ran the first exclusive exhibition of aerial craft ever held in America, that he will hold the second exposition, as before in Boston, the week of February 20th to 25th.

While last year's Show labored under the disadvantage of being held at a time when practically everything outside of the Wright and Curtiss machines in the country were in the experimental stage, still a good showing was made.

This year all is changed, and with the enormous strides made in the past year Manager Campbell has much material to draw from.

The Harvard-Boston Meet aroused the interest in aviation around Boston as nothing else could do and the many thousands who attended it will no doubt take advantage of a chance to view the different machines at closer range.

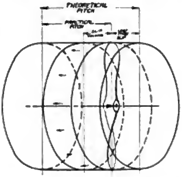
The International Aviators, Inc., comprising some of the world's greatest flyers, are making a tour of the United States and Cuba. They are under the general management of Alfred J. Moisant, brother of the Statue of Liberty prize winner. The aviators are John B. Moisant, Charles K. Hamilton, Roland Garros, Réné Simon, Edmond Audemars, J. J. Frisbie and Réné Barrier. Their first meet was held in Richmond, where they met with unusual success, but a subsequent meeting held at Chattanooga was not so successful owing to bad weather conditions, although some daring flights were accomplished in the face of high winds. They have since flown at Memphis and are booked for New Orleans and Havana.

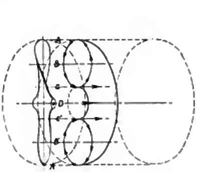
At Memphis Hamilton and Barrier did some very fast flying (although nothing like as fast as quoted in newspaper dispatches, which actually credited Barrier's Blériot XI Bis with 88 miles an hour!).

These flyers should do much to spread the doctrine of human flight during their peregrinations. They are, however, taking lots of chances in making over-city flights: even a Gnôme has been known to balk, although it is in the nature of an event when it does.

AN ARGUMENT FOR THE UNIFORM-PITCH PROPELLER

By Philip Baldwin





Modern aeronautical propellers are invariably built on the "Screw-Pitch" principle. This is due to the theory that points at greater distances from the hub of the propeller travel at greater speeds (in feet per minute) and in order to keep the air particles, on which the propeller acts, in a uniform motion, the blade angle is reduced as the blade speed increases, i. e. from hub to tip. If this is done to the degree that any portion of the blade would travel forward (theoretically) a given distance at one revolution of the propeller, we have the helix or screw-pitch.

Of course a propeller should travel through the air-mass without disturbing it. However, this is impossible owing to "slip" and it is necessary either to deduct the 10 to 50% from the theoretical foot-pitch or, what is the equivalent, to increase the blade-angle slightly throughout its length.

If a propeller is run in still air, without allowing it to travel forward, it will "cut out" a cylinder of air equal to its diameter, every particle of which *should travel backward at an equal speed.*

At this point the question arises whether the same laws hold for a propeller held stationary, running in still air, and for one travelling through the air, at its normal speed. Unquestionably they do not in theory, but owing to slip the latter case reverts somewhat to the former. In fact, the forward velocity of the propeller which is lost in slip, is practically transferred to the air column blown back, which is really the "purchase" from which the propeller works or on which it acts. This air column thus blown back may be regarded as a cylinder of air, impinging upon and passing through a mass of still air. Many similar instances can be cited and a study of a few of these should lead to an understanding of the dynamics of the case.

Take the case of a smoker "blowing rings," notice the performance of the ring and it is seen that a cylinder of air is propelled from the mouth into the mass of "still air" in the room. At the edge of this cylinder of air is the "smoke ring," and it is seen to revolve within itself, the inside traveling forward, and the outside of the ring to the rear. This, as is obvious, being due to the friction between the moving cylinder of air, and the still air into which it is propelled. Other occasions when a smoke ring is noticeable are from a saluting cannon and, rarely, from the stack of a locomotive, these depending of course upon the calmness of the outside air. Better results may be obtained from a "smoke-ring box," made from an ordinary stationery box, with a hole cut out of the center of the cover. Fill this with smoke and tap it lightly, (so as to momentarily compress the air within,) and a ring will be emitted.

A hard tap will cause a clear, sharp ring to shoot rapidly upwards, but by raising the box cover slightly, and gently lowering it, a series of rings will be seen to emerge and float slowly upwards, affording a good chance to study their evolutions. In any case when a smoke-ring is produced, its center is very small, and grows larger as the ring expands. It is with the first stage of the ring that we will deal.

Let us assume the two circles of Fig. 2 to be part of a smoke ring, cut through to show its section. As has been stated, the ring, acted upon by a force in the direction of D, revolves within itself, as shown by the arows. Friction with the outside air-mass causes this rotation and reduces the velocity of the extreme edge of the ring to zero, as shown at A and A' This ring then apparently rolls inside a tube of air, and its maximum velocity being at C and C' the points B and B' must attain a velocity equal to one-half that at C and C'. The portion between C and C' forms the shank in most propellers, and does not assist in propulsion.

The above may be assumed to be the relative velocities of various portions of a disc of the air column sheared loose by the slip of a screw pitch propeller while traveling through the air at its normal speed.

Taking a typical wooden screw pitch propeller, the blade incidence-angles* are found to be as follows at the different radii corresponding to Fig. 2: At C and C', 14°; at B and B', 7°; and at A and A', 3°30'. In order to raise the velocity at B and B' to that of C and C' we must double it and hence increase the blade-angle of the propeller as much again, (from 7° to 14°). A and A' having no velocity, it will be necessary to increase the blade-angle considerably at this radius. Doubling the blade-angle at B and B' (7° to 14°) increased the velocity at this point by one-half the velocity at C and C' which added to the initial velocity (one-half C and C') gave the required amount. Hence, increasing the blade angle at A and A' to the former angle of B and B' should give this radius the former B and B' velocity, or one-half that of C and C', (i. e. 3°30' to 7°.) By doubling this angle we again reach the velocity of C and C': (2x7°).

These angles may then be assumed to give a "slip column" of air of uniform velocity, and as this is what the propeller pushes against, this would give a more efficient background for "propeller purchase," so to speak, than the varied velocity column delivered by the screw pitch propeller.

It will be noticed that the products of increasing and doubling the various angles result in each case in the same angle, namely 14°. Correcting this angle throughout its length in order that the theoretical and practical foot pitch may agree, add, say 2°30', and the result is a uniform or straight-pitch propeller, with a blade angle of 16°30'.

*Blade angles not corrected for slip.

HENRY A. WISE WOOD'S TERMINOLOGY

Editor, AIRCRAFT:

SIR—It has occurred to the writer that while the language of flying is still in flux an effort should be made to provide the art with a native nomenclature of concise and pertinent terms. While all that led to successful flights by no means was done by Americans, still because the Wrights were the first actually to stay in the air upon a power-lifted and driven device the first mechanical bird may properly be classed as an American fowl. Therefor, as well as for the more practical reason of economy in speech-effort, the introduction and acceptance of a foreign terminology should be resisted, and the language of flight set upon an all-English-American basis. That even from an esthetic standpoint the proposed movement is desirable must appear to anyone who will but listen for a moment to the current pronunciations of the words, chauffeur, garage, chassis.

In order that the subject may be opened for discussion the following glossary is offered; in which, also, is suggested the substitution of what is believed to be better and simpler English terms for many now struggling into use.

Aeroplane—Airplane.
Aileron—Independent Stablizer; Stablizer.
Alighting—Grounding; to Ground.
Altitude—Height
Aviation—Flying
Aviation Tournament—Flying meet; A Fly.
Aviator—Airman; Flyer.
Vertical or Direction Rudder—Director.
Horizontal or Elevating Rudder—Elevator.
Epinage—Tail.
Chassis-porteur (sometimes, landing chassis) Carriage; landing-carriage.
Cloche—Bell-control (of the Blériot, for instance).
Fuselage—Body (as distinct from planes, rudders, power-plant and auxiliary devices).
Hangar—Shed.
Propeller; Tractor—Screw; Fore-screw; Aft-screw.
Pylon—Mast
Vol-plané—Glide; to glide; to plane.
That portion of a plane which is warped—The Warp.
The Wire or Cable used to control warping—Warp-cord.
The Wire or Cable used to control elevation—Height-cord.
The Wire or Cable used to control direction—Steering-cord.
That portion of the start which is upon the ground—The Run
That portion of the start which is between the run and the height sought—The Rise.
Failure to rise after a run—A Misup.
The length and nature of a grounding may be spoken of as—A long ground, a short ground; a hard ground, an easy ground.

HENRY A. WISE WOOD.

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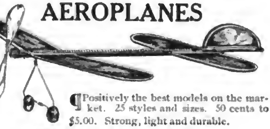

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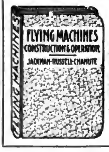

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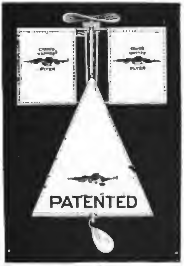

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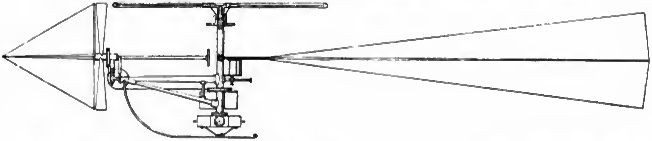

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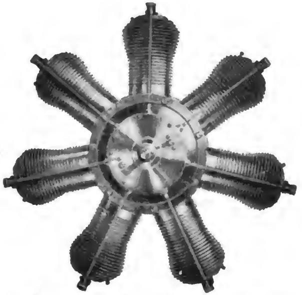

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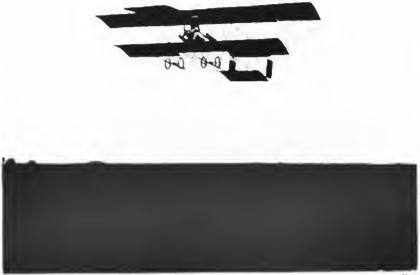

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AIRCRAFT

Vol. 1 FEBRUARY, 1911 No. 12

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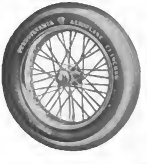

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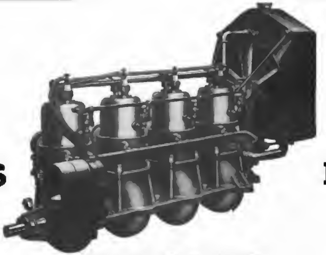

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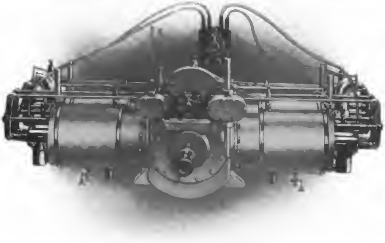

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A I R C R A F T

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ALTITUDE MEASUREMENTS AND RECORDS

By Major S. Reber

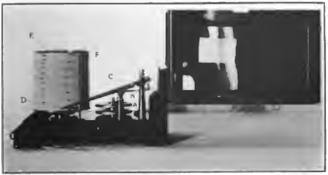


FIG. 1—BAROGRAPH.

RECENT progress in aviation has been so marked and the records made by aviators at the various meets and exhibitions both abroad and in this country have exceeded those made at the previous ones with such rapidity that the beginnings of the art and the records that were then considered marvelous now appear as hardly worthy of comment. In December, 1908, the world's record for altitude was 360 feet; for duration, 1 hour, 54 minutes and 23 seconds, during which time a distance of 61 miles was covered without touching the ground. Now, at the close of 1910, the world's record for altitude is 11,474 feet, and for duration 8 hours, 23 minutes, and distance 320.63 miles. During the International Aviation Tournament at Belmont Park all the world's records for speed from one to one hundred kilometers, and the world's record for altitude, were broken, but competition is so keen that these records were exceeded within a month afterward.

At Belmont Park substantial prizes were given the aviators who attained the greatest heights in the various hourly contests and special prizes were offered to the one that made the greatest altitude during the meet and to him who should exceed the world's record of 9,186 feet made by the Belgian aviator Henri Wynmalen at Mourmelon on October 1st. It was confidently expected that the world's record would be broken during the meet and this expectation proved a reality when Johnstone in a "Baby Wright" reached an altitude of 9,714 feet at about 4:30 P. M. on the afternoon of the 31st of October.

The Aviation Committee, of which I had the honor of being a member, imposed upon me the duty of measuring and recording the altitudes that were attained during the meet. A study of the methods of measuring and determining altitudes used at Atlantic City in July, at Boston in September, together with my own experience at Hammondsport in June of this year, led me to believe that these methods might not prove entirely satisfactory at Belmont Park. At Atlantic City theodolities were placed at the extremities of a known base line and each instrument directed at the station at the opposite end of the base. The horizontal limbs of the instruments were clamped so that the line of collimination of each instrument was in the vertical plane passing through the base and angles of elevation were read at the moment of transit of this plane by the aeroplane. From these observations the altitudes were computed. At Boston two base lines were used. At the extremities of one of these sextants, having extensions of both horizon and index glasses for convenience in finding the aeroplanes, were mounted on posts and their planes brought into coincidence with the vertical plane passing through the base line. Angles of elevation were read at the moment of transit of this plane by the aeroplane. Theodolites with full vertical circles and inverting eye pieces were located at both ends of the other base line. Simultaneous observations for altitude and azimuth were made on the aeroplanes and the altitudes computed from the observations. The observers at the ends of this base line were connected by a telephone line so that the readings should be simultaneous. At Hammondsport the method of simultaneous readings of azimuth and altitude from both ends of a known base line was used and the altitudes calculated from the observations.

If altitudes of considerable magnitude are to be measured by instrumental observations from the extremities of a base line,

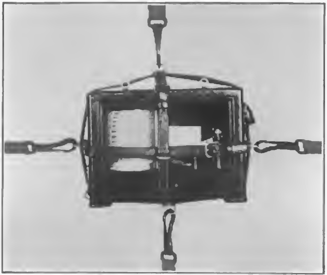


FIG. 2—BAROGRAPH STRAPPED TO AEROPLANE.

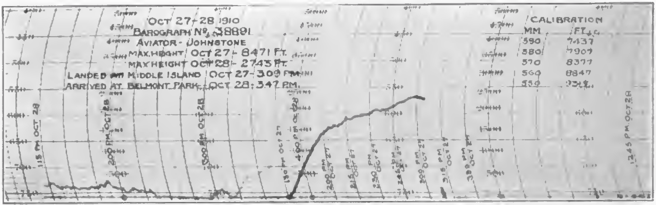


FIG. 6—BAROGRAPH RECORD OF ALTITUDE FLIGHT BY JOHNSTONE AT BELMONT PARK, OCTOBER 27—8,471 FEET, IN WHICH ALTHOUGH FACING THE WIND HE FLEW BACKWARD 42 MILES.

the latter should have a length of four or five miles or greater, and it is absolutely necessary that the observers be connected by a telephone line. In order to make the readings simultaneous each observer should have a breast transmitter and a double head receiver. If observations are not absolutely simultaneous considerable error is introduced in the results. The above method is open to the objection that at considerable altitudes an aeroplane is liable to be lost from view by passing through the clouds and at a low or medium altitude it will be lost to sight in hazy or foggy weather or in case of rain. The method of measuring elevations at the time of transit of a fixed vertical plane is open to the objection that the altitude at the time of transit is not necessarily the maximum altitude attained and moreover it is very difficult for an aviator while making his ascending or descending spiral to be sure that he passes through the fixed vertical plane. For the above reasons, and owing to the limited time at my disposal before the opening of the meet, I decided to use calibrated barographs for measuring and recording altitudes. By calibrating each barograph under known conditions of temperature and pressure so that the various parts of its scale may be read in feet, instrumental errors were compensated for and the uncertainty produced by a lack of knowledge of the mean temperature of the air column is eliminated. The barograph (Figure 1) is simply a recording aneroid and consists of a corrugated metal box (A) from which the air has been partially exhausted. The movements of the sides of this box, caused by variation of atmospheric pressure, are magnified by the levers (B) and (C). At the end of the lever (C) is attached a pen (D) which traces a record of the variation of pressure on a graduated record card fastened to the cylinder (E) which is driven by a clock mechanism in its interior. The pen lever (C) can be moved outward from the cylinder (E) by a standard (F) so that when not in use the pen is away from the paper and no graph traced on the record card. By using a suitably graduated scale the barograph can record variations of atmospheric pressure in inches or millimeters of mercury. It is well known that as the altitude above sea level increases the atmospheric pressure decreases and the barometer falls. The relation between the difference in altitudes in feet and the difference in the simultaneous barometric readings at two stations is given by what is known as Laplace's formula for the barometric determination of heights. As a barograph gives a continuous record of the variation of atmospheric pressure if one should be attached to an aeroplane and the aeroplane vary its altitude a record of the variation of atmospheric pressure, due to change in altitude, would be traced on the cylinder. From this record the altitude of the various points of the aeroplane's path can be calculated by use of the formula.

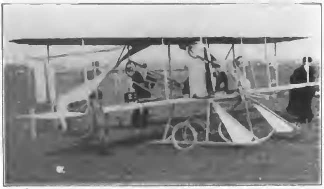


FIG. 3—BAROGRAPH SUSPENDED BETWEEN THE PLANES OF THE BABY WRIGHT IN WHICH JOHNSTONE BROKE THE WORLD'S HEIGHT RECORD AT BELMONT PARK.

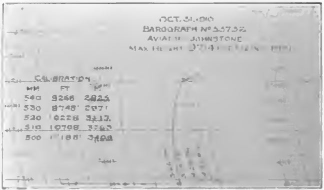


FIG. 4—WORLD'S ALTITUDE RECORD MADE BY JOHNSTONE AT BELMONT PARK, OCTOBER 31, 1910—9,714 FEET.

In order to prevent the vibration of the machine from blurring the graph of the pen the writer devised the elastic support shown in Figure 2, which consists of three leather straps encircling the barograph. At two opposite points on each strap D rings are sewn. Pieces of elastic webbing hooked to convenient points on the machine or fastened to strings and these latter tied to suitable points on the frame so that the barograph hangs free. Figure 3 shows a barograph suspended between the planes of the Baby Wright in which Johnstone broke the world's record.

The barographs used at Belmont Park were of the well-known Richard pattern, three with aluminum and eight with wooden cases. Two of the barographs read to 3,500 and the remainder to 5,000 meters. The clock movements of some were six hours and the remainder twenty-four hours. The record cards for the 3,500 meter instruments have the scale divided into equal parts, while on the 5,000 meter cards the scale of equal parts reads to millimeters.

Just previous to the meet the clock movements were regulated and the barographs calibrated, under my direct supervision, in the laboratory of Mr. H. J. Green, the well-known maker of barometers, by Lieutenant C. C. Culver and Mr. Nehrbas. The method used was as follows: A barograph, whose pen had been set to zero, a standard thermometer and the open end of a siphon barometer were placed under the bell jar of an air pump and the air gradually exhausted. Readings of the thermometer, the siphon barometer and barograph were taken at the 760, 700, 650, 600, etc., milimeter points on the 5,000 meter barographs, and at the 0, 500, 1,000 1,500, etc., meter points on the 3,500 meter cards, and at the same time the room pressure and temperature were taken by standard instruments. The differences in altitude corresponding to the difference in the readings of the mercurial barometers were computed by means of the formula and tables given in the third revised edition of the Smithsonian Meteorological Tables, pp. xxvii-xxix and pp. 100-109. The temperature of the mean air column, which is the uncertain factor in the ordinary case, was accurately known, as the temperature of the air in the bell jar did not vary from that of the outside room. It was assumed that the pressure between points of calibration followed a straight line law and a table of altitude in feet was constructed for the various scale readings of each barograph. The following sets of readings, one for each type of barograph, will illustrate the method, and it is to be noted that the barometric readings given below have been reduced to 32° F.

BAROGRAPH No. 53761 (MILLIMETER SCALE.)

			Calibration.	
			Meters.	Feet.
Pressure in bell jar.....	29,947	27.676	760	....
Barograph reading......	760	700	750	367
Room pressure	29.947	29.947	740	734
Mean temperature	77°F	77°F	730	1101
Latitude	41°N	41°N	720	1468
Altitude in feet.........	....	2202	710	1835
			700	2202

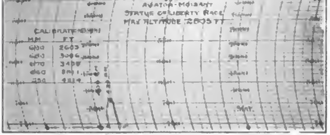


FIG. 8—MOISANT'S STATUE OF LIBERTY FLIGHT, OCTOBER 30.

BAROGRAPH 56418 (METER SCALE). Calibration.

			Millimeters.	Feet.
Pressure in bell jar....	25.001	23.617	1500	5120
Barograph reading......	1500	2000	1600	5450
Room pressure	29.970	29.970	1700	5780
Mean temperature......	76°F	76°F	1800	6111
Latitude	41°N	41°N	1900	6441
Altitude in feet.........	5120	6771	2000	6771

After calibration the barographs were very carefully transported to Belmont Park and kept in a locked room in the Administration Building. A seven-day barograph, an aneroid which had been carefully compared with the Weather Bureau standard in New York City, a Richard combined barograph and thermograph, and a Green standard mercurial thermometer formed part of the instrumental equipment. Each day at about 11:30 A. M. the clocks were wound, record cards were placed on the drums, the pens filled and released to see if they recorded properly, the barographs set to zero, the seven-day barograph set with the aneroid and the thermograph set with the standard thermometer. The barographs were then placed in the leather harness and these sealed with wire and a lead seal, using a seal press. At about 1:00 P. M. each day the barographs were taken by hand over to the starter's house, where they were attached, on application, to the machines that were about to compete in the altitude events. On landing the barographs were detached and turned over to Lieutenants Culver or Foulois, of the Signal Corps, who immediately inspected the seals to see if they were intact. At the close of the daily programme all the barographs were returned to the room in the Administration Building. The record cards were carefully removed and the scales read independently by both Lieutenant Culver and Lieutenant Foulois, using a powerful reading glass, before the ink had dried or been blotted. It is to be remarked that the ink used in the barographs is a special kind that does not dry rapidly. The heights corresponding to the scale readings were taken from the calibration table. A very gratifying check of the accuracy of the methods used was had on the afternoon of October 30th, when Latham took up two barographs with him in his Antoinette. Barograph No. 53735 recorded his altitude as 3,395 feet, while barograph 53732 showed 3,378 feet, giving a difference of only 17 feet, which is a smaller amount than can be read by the eye on either scale.

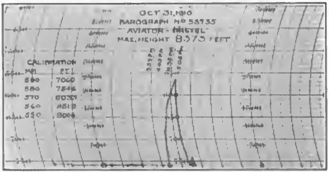


FIG. 5—DREXEL'S ALTITUDE FLIGHT, OCTOBER 31.

The weather conditions on the afternoon of the 31st of October were ideal for an attempt at the world's altitude record. The soft haze of Indian summer, the almost balmy air coming as a gentle westerly breeze of about seven miles an hour, and the thermometer registering about 60°F, led both Johnstone and Drexel to make an attempt to break the world's record, and they

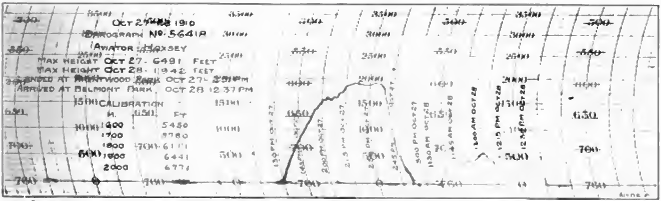


FIG. 7—BAROGRAPHIC RECORD OF THE REMARKABLE RECEDING OF FLIGHT BY HOXEY FROM BELMONT PARK TO BRENTWOOD PARK, OCTOBER 27, 1910.

each applied for a barograph for the purpose. Tbe two barographs that had checked so closely against each other the day before were attached to their machines, No. 53732 to Johnstone's and No. 53735 to Drexel's areoplane. Figure 4 tells the story of Johnstone's flight into a region where man had never before penetrated in a heavier than air machine. He crossed the line at 3:34 P. M. and ascended steadily at a practically uniform angle of climb at a rate of 206 feet per minute until he reached an altitude of 9056 feet, where evidently he encountered difficulties, as in the next twenty minutes he fought to gain 275 feet, when he dropped suddenly about 100 feet and then he began his last uphill climb, until he reached the highest point of his career, 9,714 feet above the starting point at 4:50 P. M., just as the sun was nearing the Western horizon. Little did we, who saw him at that time a mere speck in the evening sky, think that this was to be the highest point ever to be reached by this courageous man, in whose tragic death a few days afterward America lost one of her most skillful and daring aviators. The difficulties that he encountered, the persistence and courage that he displayed may be realized in the fact that in the first forty-four minutes of his journey in the air he rose 9,056 feet above the ground, and in the next thirty-two minutes he could make but 658 feet. After remaining near his maximum altitude for about eight minutes and ascertaining that his gasoline was practically exhausted he volplaned rapidly down in seven and one-half minutes, at the rate of over 1,200 feet per minute, the possessor of a new world's record. Drexel, as will be seen from Figure 5, left the ground twenty-five minutes later and rose steadily, but more slowly than Jobnstone, as he required fifty-seven minutes to reach his maximum height of 8,373 feet, wbich was done at a practically uniform angle of climb at an average rate of 161 feet per minute. After reaching this point he immediately volplaned down in eight minutes at a rate of 1,047 feet per minute.

Two most interesting flights illustrating the stability of the Wright biplane occurred in the afternoon of the 27th of October, when Johnstone and Hoxsey crossed the starting line within a few seconds of each other in a puffy westerly wind which averaged from twenty-five to thirty miles per hour near the surface of the ground. Latham, that most skillful of air men, took his Antoinette up in this puffy wind, but after making a few laps of the track decided to come down. The force of the wind was such that one time during his flight he headed his Antoinette into the wind, and though his engine was going full speed ahead he hung for about a minute, apparently motionless in the air, like a gigantic, graceful, dragon-fly. During the first half hour of Johnstone's flight he arose against the wind to a height of 5,450 feet, and then after fighting for a little more than an hour, in which he gained 3,421 feet additional height, he came rapidly down at Middle Island at nine minutes after 3, some forty-two and one-half miles east of his starting point. The next day he flew back to Belmont Park, taking a thirty-minute rest in the middle of his journey, and arrived at 3:47 in the afternoon. Hoxsey, as will be seen from Figure 7, experienced about the same difficulty with the wind. He reached his maximum altitude of 6,491 feet fifty minutes after starting and remained at about this height for about fifteen minutes, and then he descended in a more leisurely manner, landing at Brentwood Park, some twenty-four and a quarter miles away. The next morning he returned in a continuous flight to Belmont Park in a leisurely manner in a little over an hour.

During Moisant's Statue of Liberty flight (Figure 8) on the afternoon of the 30th of October, in which he made a distance of thirty-four miles in 34 minutes and 38.8 seconds, he rose rapidly and rounded the mark at the Statue at an altitude of between 2,200 and 2,800 feet, and kept well up till near the finish line of the race.

The following are the best performances for altitude during the International Tournament:

Johnstone	9714 feet,	October 31st.
Drexel	8373 feet,	October 31st.
De Lesseps	6931 feet,	October 25th.
Hoxsey	6705 feet,	October 27th.
Brookins	4882 feet,	October 24th.
Parmalee	3819 feet,	October 28tb.
Latham	3772 feet,	October 25th.
Simon	959 feet,	October 30th.
Barrier	932 feet,	October 30th.
Willard	629 feet,	October 24th.
Radley	614 feet,	October 30th.
Ely	412 feet,	October 24th.

LAW AND THE AIR

By Denys P. Myers

(Concluded from January AIRCRAFT.*)*

AERIAL COMMERCE

Saw the heavens fill with commerce, argosies of magic sails,
Pilots of the purple twilight, dropping down with costly bales.

WHAT law will govern the commerce of the air which Tennyson foresaw is now a practical question of the immediate future. The customs rules of France have already been violated by the carriage of goods —albeit only a few cigars—by the aerial route across the border, and the possibilities of the coming months were considered so great that the International Conference on Aerial Rights, which met at Paris from May 18 to June 29, finally adjourned *sine die* late in November, 1910, because none of the nineteen sovereign states participating in it were willing to mortgage their future to the extent of signing a binding convention.

A detailed analysis of the text of the draft convention prepared by the conference was published in the London Times of November 29 and republished, without credit, by the Boston Transcript December 9. The Times published an editorial on the code December 16 and the New York Evening Post on December 12, the latter crediting its source. The draft convention follows pretty closely the conclusions of these articles, but says very little of specific commercial situations. What it does say may be dealt with as the most advanced expression of legal thought on the points it touches.

"Each contracting State has power to regulate passenger and goods traffic between points in its own territories, and consequent restrictions must be at once published and notified to other Governments interested," writes a correspondent of The Times. "Interdicted zones are to be indicated with sufficient precision to permit of their being indicated on aeronautical charts of the scale of 1,500,000 at least. The contracting States are bound to communicate these charts to one another. . . .

"Each State will exercise the right of police and customs supervision in the atmosphere over its territory, and the personnel of an airship must comply strictly with the police and customs regulations of the country over which it is travelling. . . .

"On behalf of Belgium, Baron Guillaume expressed the regret of his Government that a proposal made by it on May 25, with the idea of facilitating international navigation, that airships should be exempt from duty, had not been accepted.

"It was agreed that airships temporarily coming to earth in foreign countries shall be exempt from duty, that provisions and working materials shall enjoy the customary tolerance, and that passengers' luggage shall be treated as if it had arrived by crossing sea or land frontiers. Merchandise can only be carried under special conventions or in virtue of internal legislation."

It is the probable content of these conventions to be made for merchant aircraft, a subject the conference led up to only, that shall be attacked here—aerial admirality it might be called.

While the term airman is coming into vogue, so far the counterpart of the ordinary seaman is lacking in the air, each pilot being master of his own craft. Yet as the rights and duties of seamen are among the most important problems of admiralty, so will the rights and duties of ordinary air-sailors on liners and tramp aeroplanes become problems for the future jurist. At sea every person employed or engaged to serve on board is deemed a seaman, who thus becomes a ward of admiralty with a prior claim over all others for wages. It is a practical rule to adopt for the air. Admiralty says that the master of the vessel cannot proceed *in rem*, that is, against the ship itself as a property, for wages under the general rule, but the privilege is unsettled under statute provisions, and it is likely that when the case arises in respect to aircraft, the added hazard of aerial travel will weigh heavily against the adoption of the admiralty rule.

Likelihood that aircraft will be employed to carry cargoes of a bulky nature is too remote a possibility to consider and difference in weight and bulk are likely for many years to be the chief distinction between the merchandise that goes by air and that sent by earth or sea. Damage by mishap, short of injury by fire, is therefore less in the sky and the chances of land and water being littered with aerial flotsam and jetsam proportionately smaller. But, notwithstanding the practicability of the *vol plane*, masters of aircraft will be much concerned with their rights over cargo, when it is a question of safety for themselves. Probably long years of judicial ransacking of brains will have to be done before the privilege of jettisoning cargo is well defined, but the law of general average can be borrowed for immediate use.

By it each consignor is responsible in proportion to the value of the goods he owns to contribute to the loss of one whose property has been voluntarily sacrificed for the benefit of all by the master, or under his authority. It will be easy enough to make over the rule to fit the air. Safety in the air is still imperfectly understood, but appliances to guarantee it are being invented and mishaps to aircraft will decrease accordingly. When they do occur they are more likely to be thoroughly disastrous than at sea, and the consequent danger to the whole aerial eargo will, in the nature of things, be greater than in similar circumstances on the ocean.

A ship may spring a leak in its side and only a portion of the cargo needs to be thrown overboard to get at the broken place. A ship keeps afloat many times irrespective of whether it has twenty tons or forty tons of merchandise in its holds. A break in an aircraft does not offer the same sporting chance. To a greater degree its safety depends upon the amount of weight it has to bear up, and its engines are its life. The heavy goods, of course, would have to go, and this is a point for the insurance men. A successful glide might depend upon the difference between carrying a mail sack or hurling it down; it would not be affected by the presence of a packet of diamonds.

Salvage in the air is a proposition that will be essayed some time. Salvage money for rescue at sea consists of compensation and bounty. Ships naturally float; aircraft do not in their element. It is to be expected, then, that bounty for aerial salvage will cut a larger figure than on the ocean, although the same general rules can doubtless be adjusted to fit the less stable medium. A subsidiary rule of salvage can be taken entire. The freight is not cancelled until the contract is complete, and any loss incurred therefore falls on the consignor, for whom the craft itself is security.

Aviators in these present days are a high class of men, but soon "going to air," as going to sea, will be the vocation of thousands, and there will be bad debts, unfortunate ventures and all the business troubles mankind encounters. Claims against the property will in consequence arise and a scale of settlement must be arranged for the liabilities incurred in sailing the atmosphere. Against a ship financial claims are preferred in this order: Seamen's wages; material and supplies, general average, towage and pilotage; bottomry, which consists of obligations executed generally in a foreign port for repayment of advances to supply necessities; and, finally, mortgages.

Probably the same order could be transferred to aircraft, along with the conditions attaching to bottomry liens and mortgages. The former constitutes a lien which may be enforced in admiralty, but is void in case of loss of the ship before its arrival at its destination. No objection occurs against such a provision for aircraft. Marine mortgages differ from those executed on other property in that the last one drawn is the first claim. This is on the basis that the last mortgage is the one which most immediately preserves the property and that it is for the benefit of the prior claims. If that theory holds true in the case of ocean vessels it should prove equally true for aerial ones.

In admiralty are many things to be disregarded in the law of aircraft. There are the elaborate rules of pilotage, for which the sky highway will have no use for years, if ever. It is a nice question whether aerial tow boat services will be established, especially to warp the craft into their berths; or whether all such aid can be given by the throwing of lines from the wharf of the aerial termini. Bottomry itself, a subterfuge usually resorted to by tramp steamers, may not be necessary for aircraft to adopt, and in the same class is the respondentia, the hypothecation of cargo.

Barratry is a division of admiralty law that will almost certainly be transferred to an important position in the law of the air. Barratry consists of an act committed by the master or mariner for an unlawful or fraudulent purpose contrary to duty to the owner, who sustains loss. Just as the master of an aircraft will be empowered, as his compeer at sea, with full control over his crew and vessel, he stands as good a chance to be faced with a situation involving barratry, while the possibility of there being airmen capable of perpetrating fraud, when "going to air" becomes a regularly practiced vocation, is fully as great as among the ocean-going class.

An illustration is where the master of the vessel sells a false bill of lading in a port not the home one. When this situation was presented in the court, the holder of the bill of lading recovered from the owner. Mention of a bill of lading suggests some referenee to the immense body of commercial law, strictly speaking, which now exists and which in the main principles can be applied to aerial commerce as easily as the seaborne trade. The rights and duties of business societies and corporations, ordinary acts of commerce, rules of affreightment, letters of exchange, rights in cases of failure are not essentially affected by the mere method of transportation. On the other hand, rules as to wrecks, risks, etc., must take into consideration the means of carriage.

These, however, need not be greatly changed to meet the conditions of the air in many cases. Take the rules of collision, where in admiralty negligence is held to be an essential to recover. Where neither vessel is at fault neither can recover and the loss rests where it falls. Where both are at fault the loss divides, irrespective of degree, an important point, for if a $100,000 steamer and a $10,000 yacht were in collision and each sustained a loss of half its value, or a total of $55,000, each owner would be held for half this sum, or $27,500 a-piece. In collision an innocent third party recovers against both, half against each. The market value of the craft is recovered if the loss is total and if loss is partial an allowance is made for deprivation of use.

None of these rules, as it can be seen, require much alteration to apply to the cognate element of air, and the same may be said of the generality of law relating to commercial operations as opposed to the relations of aerial craft to the state itself.

In both fields, however, it is eertain that broad principles will be maintained where possible for the air, a body of exceptions for situations unique to the air gradually growing up as a result of statutes and the decisions of courts.

EDITORIAL

MARTYRS

NATURE HAS AN INTELLIGENT WAY of instilling into the various forms of life a desire to do those things that are necessary and are a part of its infinite scheme. It also has a wise method of making pleasant those desires necessary to the very existence and propagation of living things. For instance, all life, or as much of it as we understand, requires nourishment, so nature makes it a pleasant task to absorb nutriment in one way or another and if it was not for the fact that it was pleasant to eat and drink, earthly animals would have no incentive to do so and consequently would starve to death, and so it will be found that the tendency to accomplish anything in life is invariably based upon a pleasant sensation, in one form or another, produced by the act itself.

Because of nature's intention to perfect certain terrestrial plans it becomes necessary for earthly animals —both human and inhuman—to live, and so Nature has instilled into these animals an intense desire TO LIVE and this desire has become so saturated in man's makeup during the past million years that it might now be considered a mania.

So life's antithisis—death—is usually shunned as some terrible end to look forward to by the average human being.

But while Nature wisely puts fear of death into the minds of most men she also very wisely creates some men without it and through that select few the dangerous work of progress is performed.

It is always the new and untried things that are fraught with the most danger and it is he who dares to tread into new fields who aids mankind the most.

To die while endeavoring to learn Nature's so-called secret laws for the purpose of uplifting humanity, should be every human being's greatest aim, for after all the supplying of knowledge and happiness to others is about the only thing worth living for.

When a man has done some one thing during his life that no one else has ever accomplished before and which proves a factor toward the sum total of human progress, he is entitled then, and then only, to feel proud of his work—yes, even conceited over it, if he likes.

If a man, while performing some great service for mankind, loses his life, he does not need our sympathy—his memory should stir our personal gratitude, our unstinted praise and every honor we can bestow upon his name. Instead of weeping for him we should weep for ourselves—for that which WE have lost. We should weep when we realize how small we are in comparison to him who gave up his life to aid us and our descendants.

And we should remember that it is not the length of our lives that count—as a few years in time is hardly worth speaking about—but the quantity and quality of the work we do.

Some men who have died at thirty years of age, have done more and better work than others who have lived to be centenarians.

Better live one year of useful activity than one hundred years of useless inactivity. It is better to die anyway at the very height of our mental strength than to be forced to live after our energies have been exhausted and we are on the road to imbecility.

Therefore dying in action is the greatest blessing that man could possibly expect and hope for. No man should be ashamed to die with his boots on unless it is at the end of a rope or some other soothing end civilization bestows upon those who perform questionable deeds.

So all honor to the martyrs of aerostation and aviation: hats off to those grand and glorious pioneers of aerial progress; those splendid heroes who gave their lives endeavoring to teach us worm-men that the time has arrived for us to unfasten our feet from the mud of the earth and soar away into the upper regions, through and beyond the atmosphere in search of a higher and nobler life than any we have yet contemplated.

INDUSTRY

HARK! YOU AMERICAN, to the call of a new industry. One of greater magnitude and far reaching effects than any the world has ever known and no doubt far beyond anything we are able to conceive at the present time, even if we go to the limits of our imagination.

You are spending millions of dollars annually competing for foreign trade; you are sending agents everywhere upon the face of the earth in search of markets for your wares; you are even willing to go to war with some powerful nation in an attempt to secure some slight commercial advantage, and still right in under your very nose, an industrial field has been discovered, the richness of which almost staggers the intelligence of those who have already looked into it.

Progress has at last forced man into a field of endeavor without limitations. The flying machine is born and from it an industry which within fifty years will have grown to greater proportions than that of the steamship, railroad and automobile industries combined.

TRANSPORTATION is the most essential thing in life. The ability to shift substance from one place to another is apparently nature's foremost purpose; in fact, judging from the workings of the electrons and on up to the greatest bodies in space, moving things about appears to be nature's only aim.

From a human standpoint transportation began from the time man first shed his tail. In those days he was satisfied to transport his anatomy from place to place upon his own hind legs and his goods upon his own shoulders. But with the development of his brain cells he was not long in seeing the advantage of shifting the burden to the backs of his four-footed relations. So the ox, horse, elephant, mule, zebra, dog, goat, camel and even the biped ostrich were persuaded into the service.

But man was not content to put up very long with the eccentricities of these brutes, they, especially the mule, not always reaching their destination on schedule time. So he devised other means—mechanical means —as a surer, safer and speedier method of transportation, the result being, the raft, dugout, sailboat, steamboat and motor boat on water, and the steam locomotive, electric car and automobile on land.

Progress, however, will not allow man to stand still anywhere, and about the time he had developed a high standard of water transportation and land transportation he was pushed another step forward and given an insight into air transportation, the speediest, safest and most economic method yet adopted. (A few years will have to elapse for proof of this statement).

Many important steps in the future of aerial navigation could be correctly forecasted at this time, but we merely want to point out here the fact that air travel has already begun and will develop just as rapidly or even more so than the automobile, steam boat or railroad has done.

It is a fact that more than sixty miles an hour can be made in an aeroplane. It is a fact that an aeroplane can remain in the air more than eight hours without landing. It is a fact that an aeroplane can carry five passengers at a time.

These three facts alone prove that flying is now practical and that flying machines can be utilized for practical purposes, even without further improvements —the marvelous improvements that will come with astonishing rapidity in the future.

At the present time aeroplanes can be used to great advantage in such countries as Alaska, where the snow and ice in winter make the roads impassable for either land or water transportation.

They can be utilized to travel in Africa or other sparsely settled countries where railroads are unknown and where there are no roads for automobiles. In such countries it would be possible for man to cover as much distance in a half hour's air trip flying over the wilderness, as would take weeks to pass through it. It can be used to good advantage right here in America now, as a carrier of important mail, and it must be adopted immediately by the armies and navies of every country in the world that want to keep on a proper war footing.

It can be utilized to-day for sport and pleasure and for a great many other purposes which we cannot think of at this moment.

Roughly estimated there will be a demand for 10,000 flying machines throughout the entire world during the year of 1911. Allowing an average cost of $3,000 for a machine means that $30,000,000 will be spent in the flying machine industry this year.

Now, the question is, Mr. American, do you intend to go after a good portion of that $30,000,000, or are you willing that the Frenchman shall gobble up the bulk of it as he has been doing so far. Mind, the figures above are merely quoted for this year's business. If you will take the trouble to figure out the ratio between ten—the total number of flying machines on earth three years ago—and ten thousand—the total number there will be at the close of this year—you will readily see—foresee—what an enormous quantity of them will be wanted three years hence.

Rather a healthy industry to look forward to is it not? So, American capitalist, and American mechanic, we advise you to lose no further time in taking part in the development of this great new industry.

Get into the business at once. Get there first, and let those who come later push you along in front of them, and do not forget that most of the great fortunes made out of the automobile, railroad, steamboat and oil industries, were made by the men who went into those businesses first. Profit by their success and go into the aeroplane business at once, while it is yet in its infancy. There is a greater demand to-day for machines that will fly than all of the manufacturers in the world are able to supply. Manufacture—either the complete machine, or the motor, or the covering, or the wheels, or the propellers, or the metal parts, or something necessary in the making of it.

Why should not America take the lead in this great new industry?

THE INDEX

WE CALL THE ATTENTION of our readers to the fact that this issue completes the first volume of AIRCRAFT, and that on page 446 will be found the index to the contents of the twelve numbers making up the book.

We would like our readers to examine carefully this index as it will give them a very good idea how well we have covered the aeronautical field during the past year. We also call their attention to the exceptionally large number of signed articles written exclusively for AIRCRAFT by the big men of the movement, and to another and more important fact that when we print articles not prepared exclusively for AIRCRAFT we always mention the source from which it is derived.

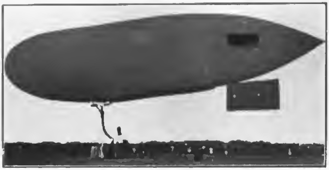
We regret that some of our contemporaries do not act so generously toward us as we often find our articles, tables and editorials published either in full or in part in newspapers and periodicals in widely separated communities throughout this and foreign countries, in which no mention is made of AIRCRAFT.

We believe from a historical standpoint that the first volume of AIRCRAFT is the most complete record of the movement ever published, not only for the year, but from the very inception of the movement itself. Our records and statistics of aviation could not be excelled, as they are absolutely correct, and all other aeronautical publications who prefer giving their readers correct information have reached the point where they accept AIRCRAFT'S figures as conclusive.

But while we feel that we have done our work well during the past year and feel proud of the large and intelligent clientele we have surrounded ourselves with, still we are going to start next year's work with the idea of beating all previous records by not only trying to please our readers, but by trying to arouse their enthusiastic applause for our efforts.

That we can only do so by giving them something better than they anticipate we realize, and to that end we shall strive.

In the meantime we are having bound up into book form what few copies of the preceding twelve numbers we have left, and until they have become exhausted, offer them for sale to our readers bound either in cloth, cloth and leather or all leather. A rare volume indeed for any library and one that will be prized more highly as the years roll on.



THE LATEST PARSEVAL DIRIGIBLE

FOREIGN NEWS

Brazil

On December 31, Piccolo, the Italian aviator, died at Sao Paulo, as a result of the injuries received in his fall a few days before.

He ascended during a fierce gale in spite of the advice of bystanders. He said:

"I shall die or be the most famous aviator in the world."

Belgium

The Belgian Army now boasts a fully-certified military aviator, Lieut. Nelis having successfully passed the necessary tests at Kiewit-les-Hasselt aerodrome on the 22nd. Later on the same day Lieut. Nelis made another flight of 2¼ hours.

At a meeting of the Sports Committee of the Belgian Aero Club on December 21st, it was decided to select the dates August 5th to 21st for the Aerial Tour of Belgium. The aeroplanes will leave Brussels on August 6th and complete the tour in seven stages, there being a day's interval between each of the stages, so that they will arrive back at Brussels on August 20th.

China

Hongkong, November 19th, 1910.

The Lawson Publishing Co.

Dear Sirs:—I have much pleasure in enclosing herewith a newspaper cutting from which you will observe there is a movement on foot to start aviation in this Colony. I sincerely hope the projected scheme will materialize. I may mention that a German friend of mine proposes to bring out an Antoinette next March or April. I am afraid there is not sufficient in this branch of sports in this Colony to warrant the formation of a Club, as about six months ago when there was an ad. in one of the local papers (S. C. M. Post) for formation of an Aero Club, only two names were returned to the proposer and

Yours truly,
T. W. NILLUTTE.

FROM THE SOUTH CHINA MORNING POST OF NOVEMBER 3, 1910.

"Early next year, if sufficient inducement is forthcoming, Hongkong may be made one of three projected centres in the Far East for the teaching and encouraging of aviation.

"This important information the 'Morning Post' is able to place in front of its readers as the outcome of an interview which took place yesterday. Inquiries on the subject addressed to the 'Morning Post' will be forwarded to the local agents of the scheme, who inform us that they will be only too pleased to meet and discuss matters with parties interested.

"Aviation has now been brought to a degree of perfection which makes it possible for anyone of nerve to fly. In Europe and America hundreds of airmen, and even airwomen, are breaking all records hitherto established for time, speed, height, distance, etc., and it therefore seems a matter of only a little time when the art of flying may become as common as navigating the seas.

"In Paris, an aviation company has been formed with the object of promoting the flying art in the Far East. At present it is nominally capitalized at $50,000, and the leading man is the Marquis de Villeneuve, a well-known, plucky and experienced aeronaut. The machine he uses is a Bleriot monoplane, similar to that which achieved the first flight across the English Channel. The Marquis has placed his services entirely at the disposal of the new company and will not only give exhibitions throughout the Far East but will conduct pilot schools in at least three populous centres.

TABUTEAU, WINNER OF THE MICHELIN CUP AND HOLDER OF THE WORLD'S DISTANCE RECORD.

"Once a certain degree of efficiency has been attained by his pupils, aviation meetings are contemplated. A new feature will thus be introduced into the sporting life of the Far East. These exhibitions are contemplated of course at points which will offer the greatest inducement, as expenses are necessarily heavy.

"Everything is to be brought from France for a beginning, but later on, should a demand set in for flying machines, the construction of aeroplanes will be carried out on the spot under supervision of specially trained mechanics.

"The centres at present contemplated are Saigon, Hongkong and one other place—probably Shanghai, though this has not yet been decided—in the north. Saigon already possesses an aeroplane given by General Beylie nearly a year ago. Unfortunately, however, owing to excessive demands made by professional aviators, the machine has not yet given any demonstration of its capabilities and, it is to be feared, has been allowed to fall into disrepair.

"There is no doubt that Hongkong offers specially attractive features for those who navigate through space, and all that remains to be done to encourage the promotion of aviation here is to obtain the cooperation of a number of prominent citizens in the scheme and the patronage of His Excellency the Governor.

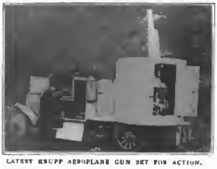
"It may not be uninteresting to recall that a good many years ago, Mr. Tse Tsan Tai, then a young man in the Public Works Department, designed on paper the airship China, reproductions of which have since appeared in many of the prominent illustrated journals. Mr. Tse Tsan Tai is still in the colony and, should the scheme fructuate will have an opportunity not only of putting his confidence in the conquest of the air to the test, but of interesting his many Chinese friends."

Cuba

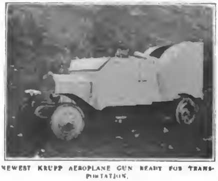
Havana will witness some great flying exhibitions during February, as arrangements for both the Curtiss flyers and the International aviators have been made for short trips to the "ever faithful Isle."

England

Mr. Thomas Sopwith, who only comparatively recently has taken up aviation, won the Baron de Forest Prize December 18th. Starting from Eastchurch, Isle of Sheppey, with a favorable wind at half-past eight in the morning, he headed for Canterbury, gradually rising until when passing over the Cathedral city, he was 950 feet high. About half an hour from the start Mr. Sopwith was over Dover, by which time he had risen about another 150 feet. Flying perfectly he continued his straight course over the Channel, and in 22 minutes was crossing the French coast line, the passage, by the aid of a favoring breeze, having been made at a speed of close on 60 miles an hour. Mr. Sopwith had fitted a compass to his machine, but as this persisted in sticking at N. W., in whichever direction the machine was steered, Mr. Sopwith backed his own judgment in preference and steered by the sun. After making the French coast a few miles west of Cape Grisnez he intended to steer for Chalons Camp, but the sun electing to hide his rays behind some dense clouds, Mr. Sopwith was left to his own resources, and so continued straight ahead. Without incident he traversed the north-eastern part of France, passing to the south of Lille, continuing on to Valenciennes, reaching soon thereafter the hilly country by the Belgian frontier, where he experienced some nasty gusts of wind. At one time the machine rolled so much that he was thrown out of his seat, but fortunately kept hold of the levers and so righted the machine. The wind continued to be very trying, and with still more mountainous country looming ahead, Mr. Sopwith deemed it



LATEST KRUPP AEROPLANE GUN SET FOR ACTION.



NEWEST KRUPP AEROPLANE GUN READY FOR TRANSPORTATION.

wise to descend at the first suitable spot. This proved to be near Beaumont, Hainauet, a few miles on the Belgian side of the frontier.

This enforced termination of the grand achievement was the more disappointing as of the 20 gallons of petrol which Mr. Sopwith carried with him he had no less than 11 gallons still left, a sufficient quantity to have easily accomplished a further 200 miles under decent weather conditions. Except for the uncertainty of the country, and the treacherous winds, which were undoubtedly due to the hilly district, not a hitch occurred with either the machine or its gear. The E. N. V. engine went through without a missfire from first to last during the journey of three and a half odd hours, and the only regret is that Mr. Sopwith was unable, by reason of the eccentricities of his compass and the disappearance of the guiding sun, to continue with his original intention of getting to Paris, which would have given him from the start from Eastchurch grounds, a distance of about 240 miles. As to the machine, when Mr. Sopwith alighted within a kilometre of Beaumont, beyond a couple of farm hands no other help was within reach, and he consequently left his biplane in the middle of the field where he came down until such time as he could send over two of his mechanics to fetch it back.

According to the rules of the prize, the distance which counted was that from the point of ascent to the point of descent measured in a straight line as the crow flies, and this in the case of Mr. Sopwith is returned as 169 miles, which was covered in three hours and forty minutes. The machine with which this magnificent performance was made was a Howard Wright biplane.

In his attempt to beat Mr. Sopwith's record for the Baron de Forest's prize Mr. Cecil Grace left Dover about 9 o'clock on the morning of December 22nd and flew over to France, where after making a wide circle over the country he landed at Les Baraques, near Calais. Mr. Grace decided to come down, as the conditions and the wind militated against any chance of doing better than Mr. Sopwith. By half-past two, taking advantage of a lift in the haze, Mr. Grace determined to fly back to Dover in order to be ready for a fresh attempt on the prize. He had previously arranged with the captain of the mail boat "Pas de Calais" to start from France some time after the boat left and follow its course by the smoke. The mail boat, however, was some ten minutes late in leaving Calais and Mr. Grace passed out to sea before she left, there to encounter a bad sea fog by which he appears to have been entirely engulfed. Since then nothing has been heard of Mr. Grace except that it was reported from the North Goodwins Lightship that an aeroplane had passed over the vessel, while a coastguard at Ramsgate declared that he heard the noise of an aeroplane's engine at a point which he estimated to be six miles off the shore. The skipper of a Ramsgate fishing smack also reported having seen a biplane when fishing to the southwest of the East Goodwins Lightship.

The result of the British Empire Michelin Cup Contest is that Mr. Cody takes first place with 189.2 miles in 4h. 47m., Mr. Tom Sopwith second with 150 miles in 4h. 7m., and Mr. Alec Ogilvie third with 139¾ miles in 3h. 55m.

These results are highly satisfactory, for they show definitely that we have in Great Britain pilots of the first class.

Furthermore, in none of these cases were the descents due to engine failure. Mr. Cody came down owing to cutting off his ignition accidentally, just when his petrol was exhausted, as in Sopwith's case, and Ogilvie ran short of radiator water.

As to the machines, the Cody, Howard-Wright, and Short machines used by the three competitors have shown themselves quite equal to any French-built biplanes in their performances.

On December 31st Mr. Cody, having received a wire saying that the Channel was fogbound, decided on flying for the Michelin Cup. Rolling up to the west end of Laffan's Plain, he started off at 8.26 a. m. in chilling cold and mist, and began to circle the 12,711 ft. course. After a few laps at about 80ft. high, he ascended to between 600ft. and 700ft. to get above the mist, and this altitude was kept for the first two hours.

He was checked by Lieutenant A. G. Fox, R.E., who, with Major Sir Alexander Bannerman, R.E., observed the flight on behalf of the Royal Aero Club.

At 10.30 the aviator had not varied his altitude, his machine seeming to fly with perfect steadiness, for not a movement could be seen.

A choppy wind sprang up at 11.15, which caused Mr. Cody to descend to a height of some 80ft.

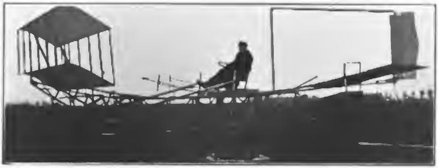
At noon he had not changed his altitude, and had covered 140 miles—a new British record.

He showed no inclination to descend, although the wind at times was quite twenty miles an hour, and at one o'clock had flown 75 laps, or about 180 miles.

Shortly afterwards, though an accidental contact of the aviator's arm with the switch controlling the ignition, the biplane came down, accidentally touching the ground. Cody switched on and rose immediately, but too late—the flight had terminated.

His actual time in the air was four hours, forty-seven minutes, during which he covered seventy-seven laps—189 1-5 miles, an all-British record

AN ETRICH MONOPLANE IN FRANCE.



THE SANDERS "TEACHER"—A DUMMY MACHINE ON A PIVOTED ROCKER TO LEARN FLYING ON TERRA FIRMA

HELENE DUTRIEU, THE WORLD'S CHAMPION WOMAN DRIVER—103 MILES, 2 HRS. 35 MIN.

HENRY FARMAN STARTING ON HIS RECORD BREAKING FLIGHT, FOR THE MICHELIN CUP—8 *hrs.* 12' 45"

for duration, speed, and distance—a record of which Mr. Cody should be proud.

Mr. Cody has flown now with this machine 1,230 miles since October 10th, 1910.

France

At Paris on January 10 the delegates to the International Aeronautic Federation upheld Mr. Grahame-White's protest against the award of the Ryan prize of $10,000 for the Statue of Liberty flight at the Belmont Park meeting to the late John B. Moisant.

The protest was presented for the Royal Aero Club of the United Kingdom on behalf of Mr. Grahame-White by Roger W. Wallace. The case for the Aero Club of America was presented by Mons. Henry Cachard, as attorney, and Edgar Mix and Hart O. Berg, American delegates.

The sitting was presided over by Prince Roland Bonaparte. Representatives of America, Great Britain, France, Germany, Austria, Belgium, Holland, Italy, Argentina and Switzerland were present.

The discussion, conducted throughout with the utmost courtesy and friendliness, lasted more than four hours.

The official decision was as follows: "The conference decides that the changes in the conditions regulating the Statue of Liberty contest were not made in conformity with article 29 of the international federation statutes, and refers the case to the Aero Club of America for new classification.

"Article 29 states that all rules and conditions concerning events at an aviation meeting must be specifically ratified by the Contest Committee of the aero club interested.

"The American delegates were unable to state whether or not the modification of the Statue of Liberty race regulations had been ratified by the Contest Committee of their club, consequently the decision of the conference went against them."

The delegates were then called upon to consider the conditions of the Coupe International d'Aviation for the current year. The American delegates were anxious to have the regulations changed so as to force the competitors to pilot machines designed and built entirely in their respective countries.

It was decided by the federation that it was not competent to make a decision of this nature affecting the vital principles of the contest, as it is merely a court of appeal, not a court of "first instance."

The conditions were amended in one respect, however, the distance being made 150 kilometres instead of 100, with the further specification that the contest must be held in an aerodrome.

The federation decided to extend the date limit for entries for the Coupe Internationale des Aeronautes until March 1 instead of February 1.

The last few days of 1910, witnessed some remarkable flying by Henri Farman, Maurice Tabuteau and Georges Legagneux, competitors for the Michelin Cup.

On December 18th, Henri Farman just missed reaching Tabuteau's record of 289.38 miles by a little over a mile, owing to the spectators' applause making him think that he had won out, the distance covered by him only being 288.07 miles, although he made the world's duration record in the attempt by remaining in the air *eight hours twelve minutes and forty-five seconds.*

On December 21st, however, Legagneux beat Tabuteau's record by covering a distance of 320.63 in five hours and fifty-nine minutes, but Tabuteau again went to the front on December 30th, and finally won the Cup by making *362.66* miles after remaining in the air seven hours, forty-eight minutes, thirty-one and three fifths seconds. He drove a Maurice Farman biplane with a Renault motor.

Henri Farman made a last attempt on December 31st, but did not succeed in doing as well as his first attempt. (See Mr. Campbell Wood's article, "History of the Michelin Cup.")

On December 21 a nonstop aeroplane flight, with a passenger, of 145 miles was made by Lieut. Cammerman, accompanied by Capt. Hugoni. Lieut. Cammerman piloted his machine from Chalons to Montigny-sur-Aube and return. The flight was made in *four hours, two minutes, and thirty-five seconds.*

BRUNNHUBER, THE GERMAN AVIATOR, ON HIS "ALBATROSS" BIPLANE, WITH FOUR PASSENGERS, WHOM ON DECEMBER 7TH, HE CARRIED TWICE AROUND THE JOHANNISTHAL FLYING GROUNDS.

The flight, which establishes a *world's record* for *distance* and *duration*, in a *non-stop passenger flight*, was undertaken under orders from the Minister of War. It is also a *World's Cross-Country Record.*

One of the remarkable series of record performances in France on December 21st was made by Mlle. Hélène Dutrieu at Etampes on her Henry Farman biplane. Competing for the Coupe Femina, she started off at ten minutes past two and was flying for 2 hrs. 35 mins., when she decided to come down as the gathering darkness made it difficult for her to see her way. She had then covered 167.2 kiloms. The first 100 kiloms. were completed in 1 hr. 32 mins., while the time for the 150 kiloms. was 2 hrs. 20 mins. In the first hour the distance travelled was 62.9 kiloms., and during the second hour 66.6 kiloms., were added to this score. By this flight Mlle. Dutrieu completely put in the shade her previous record of 1 hr. 9 mins., and Mlle. Marvingt's time of 53 mins. A likeness of Mlle. Marvingt appears on page 136 of this volume.

Following on the representations made by the leading aeroplane manufacturers of France, especially M. Breguet, the French Government have decided to postpone the latest date for entries to be made for the Aeroplane Competition from January 1st to July 1st next year. It was pointed out that as a result of trials which are now being made many of the manufacturers do not know for certain what type of engine they will adopt for the military machines, and so they could not properly fill up their entry form. It will be remembered that the machines have to be fitted with the engines mentioned in the entry forms when they are presented for the eliminating trials on October 1st next.

In a note printed by the French Minister of War it is explained that the vote of $80,000 asked for in connection with aviation in the Colonies is intended mainly for French West Africa, the Government of which colony has offered to share the expenses of the experiments. General Brun states that the money asked for will be used in the purchase of aeroplanes, which should be on the spot at the end of January. It is proposed to start with seven aeroplanes, and to build the necessary sheds, &c., for them. Should this prove satisfactory the Government has the intention of making a similar proposal in regard to the French Colonies in the Far East.

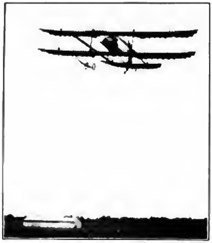
Germany

A new aeroplane, intended for military use, will shortly be tested at the Hornsidt military parade ground. This machine has been designed by two German engineers named Kormann, in conjunction with Dr. Ewald. The machine weighs, without the pilot, 300 kilogs., the planes are 12 metres span, and the lifting surface is 24 square metres. The aeroplane, which has been named "Garuda," is fitted with a 50-h. p. motor.

A town to town event including Baden-Baden, Freiburg, Mulhausen, Strassburg, Karlsruhe, Mannheim, Frankfort on the Maine, is on the books for next spring, the prizes to total 300,000 marks. Competitions will be arranged in all these cities, and a very influential committee has been formed. Saxony is planning a town-to-town flight as well, the date to be from May 20 to 29, whilst the South German circuit will be in the first half of May. Aviators in the Fatherland will find plenty to do next season, as all these events are to bear more or less of a national character.

The collections for the statue to the memory of Lilienthal are coming in almost painfully slowly in Germany and at the present rate it will take a very long time until a sufficient sum has been got together to erect the proposed memorial. A subscription was received from the Aero Club of America.

CAPTAIN NARAHARA AND AN AEROPLANE BUILT BY HIMSELF IN JAPAN WITH A VIEW TO ITS ADOPTION BY THE JAPANESE ARMY.



THE FARMAN MACHINE IN FLIGHT.

Captain Englehardt put the new Wright model well through its paces on December 8th, when he carried out a cross-country flight from Johannisthal to Gruenau and back, 35 kilometres in 29 minutes; he declared himself very satisfied with the working of the machine.

On December 4th, Amerigo, training for the Paris-Berlin flight next year, put up a new German duration record with 4 hrs. 37 secs., using an Aviatik of the latest type. The former record was held by August Euler with 3 hrs. 6 min. 16 secs.

It is stated semi-officially that the Imperial Marine Department intends to purchase aeroplanes for naval purposes and has entered into negotiations with the Albatros Works; this firm has also accepted a number of naval officers as pupils.

Experiments have been carried out recently at Johannisthal with small captive balloons carrying lights, and intended for marking routes for aerial navigation. The balloons tested were of various sizes, ranging from 3½ feet in diameter to 8 feet, and the lamps they carried were lighted by electricity supplied by a wire communicating with the earth. It is stated that the lights were visible for a distance of six miles.

India

The first public aviation meeting to be held at Calcutta attracted enormous crowds on December 28th. Tyck, on a Blériot, rose to a height of 2,000 feet, and Baron de Caters carried several passengers, including General Mohon, in his Farman.

Italy

Flying at Genoa, on December 26th, about two miles from the shore Cirri's machine came down and threw the occupant into the sea. Boats immediately set out from the shore and fortunately succeeded in rescuing Cirri. His aeroplane was lost.

Japan

The Kokumin Shimbun of Tokio offers a prize of 10,000 yen ($5,000) to the Japanese aviator who makes the best flight over a course which the newspapers will announce later.

The Kokumin points to the rapid made of late in the field of aviation in Europe and America, and adds that Japan should not lag behind the rest of the world in this important branch of practical achievement.

The Japanese government has appointed a military airship commission, and in private circles numerous would-be inventors have fairly swamped the patent office with their ideas.

Mexico

K. L. Bernard, formerly general manager of the exhibition department of the Pain Fireworks Company of New York, and later advance representative of the Bevani Opera Company, is now in the City of Mexico, where he is making arrangements for an international aviation meet to be held in February.

Mr. Bernard obtained contracts with Mons. Hubert Latham, James Radley and the Glenn H. Curtiss Company to take part in the Mexican meet.

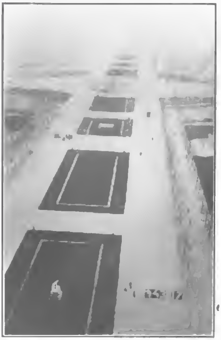
In the contracts it is provided that engines capable of developing their maximum power in a high altitude be used in the machine taking part in the meet. This is aimed to prevent if possible any repetition of the Hoxsey accident. As the City of Mexico is extremely high, it was feared that unless such engines were installed, fatalities might result.

Peru

Georges Chavèz, who fell to his death after flying over the Alps from Brigue, Switzerland, on September 23, has become a national hero in Peru. Commemorating the death of Chavèz in the Italian village of Domodossola on September 27, the Republic united in a solemn mass on October 27, in the ancient and magnificent church of San Pedro. Felipe Chavez, a brother, and other members of the family were present as chief mourners, and attendance among the diplomatic corps was general. Officers of the French cruiser *Montcalm* were invited as representatives of the country where Chavez had long lived, and where he lies buried, and officers of the Italian cruiser *Etruria* came as representatives of the country where he died.

So great was the interest in the memorial that cards of admission were exhausted two days before the service, despite the enormous seating capacity of the church. Eighty-nine singers and sixty-two instruments were used in the service. Business was suspended for the day in the capital, and rich and poor joined in a National pride of Chavez's great achievement and sorrow for his unfortunte death.

The tribute to Chavèz in his home country was a fitting culmination to the honors he received from Italy in a touching funeral at Domo d'Ossola, and from France in a service at St. Francis de Sales, interment at Père La Chaise and the insignia of a Chevalier of the Legion of Honor.



GUIDE SIGNS FOR AIRMEN.

Experimenting in Paris from the Eiffel Tower with silvered-glass ball guide signs for airmen. The above photograph shows the legibility of the 69 inch letters as seen from the first platform of the Eiffel Tower, (328 feet high). There are six sets of figures at various distances, although in the photograph the further figures are not discernable. At night these are to be strongly outlined by electric lights.

A GNÔME-DRIVEN ANTOINETTE MADE BY THE ALBATROS COMPANY.

Russia

The Russian War Office has assigned $125,000 per annum for three years ofr the construction of military aeroplanes, and $12,500 a year for the same period for the payment of payment of professional instructors. Separate grants are to be made for aeroplanes in Kieff, Odessa, Sebastopol, and Tiflis.

Servia

Mons. Roussijan, a Croatian aviator, was killed January 9th after making a flight across the River Save.

One of the propeller blades became loose and dropped into the river. The machine in falling struck a building. Mons. Roussijan was thrown from his seat and badly crushed.

Siam

An aviation week is to be held at Bangkok in February. Royal patronage has been secured and the meet is to take place at the Royal Bangkok's Sports Club.

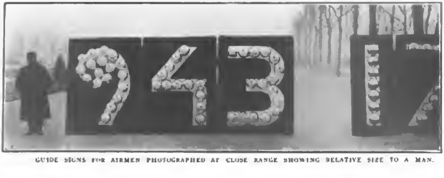
Farman and Blériot machines will compete.

South Africa

Considerable interest is being taken in various parts of South Africa in the latest developments in connection with aerial navigation, although the actual amount of flying done there up to the present has not been very great, owing to the fact that there are so few flyers actually at work. A number of lectures have been given in various towns on the subject, and at one given at Pretoria, on October 20th, General Sir Robert Colleton was in the chair, among those present being Lady Colleton and Lady Metheun. The lecturer was Major A. M. Rogers, R. E., who had been assisted in the preparation of his lecture by Mr. A. G. Heinze, who has been engaged in experimenting for some ten years past.

Ely Lands on Ship

As AIRCRAFT goes to press news is received from San Francisco that Ely started from Selfridge field, twelve miles south of the city, at 10:45 o'clock on Tuesday, January 18, and flew to the deck of the cruiser Pennsylvania, anchored in San Francisco bay. This is the first time a flight of this kind has been attempted. Ely swooped down to the deck of the vessel and landed without mishap. At 11:58 Ely left the ship on his return flight.



GUIDE SIGNS FOR AIRMEN PHOTOGRAPHED AT CLOSE RANGE SHOWING RELATIVE SIZE TO A MAN.

Garrison Kinderman Biplane, said to be the first flying machine built in West Virginia

CLUB NEWS

Aero Club of America

RULES AND REGULATIONS FOR THE ISSUE OF PILOTS' LICENSES.

The following rules and regulations for the issue of pilots' licenses were adopted at the meeting of the Federation Aeronautique Internationale in Paris in October, 1910. These rules establish uniform conditions for the granting of all three kinds of pilots' licenses in the sixteen countries represented in the Federation Aeronautique Internationale. The new conditions become effective on and after February 15th, 1911. New licenses of a uniform model will be issued with the text printed in six languages and containing provisions which are the same in all countries represented in the Federation.

AVIATOR.

Only the organization governing Aviation in each country represented in the Federation Aeronautique Internationale shall have the right to issue the license of Aviator to applicants of at least 18 years of age and under its jurisdiction, to wit:

I. Citizens.
II. Foreigners of a country not represented in the F. A. I.
III. Foreigners of a country represented in the F. A. I. (but in this case a license may be granted only with the permission of their own National organization).

Applicants must pass the three following tests:

(A) Two distance tests, each consisting in covering, without touching the ground, a closed circuit not less than five kilometers in length (length measured as indicated below).
(B) An altitude test consisting in rising to a minimum height of 50 meters above the starting point.
(C) The (B) test may be made at the same time as one of the (A) tests.

The course over which the aviator shall accomplish the aforesaid two circuits must be indicated by two posts situated not more than 500 meters from each other.

After each turn made around a post the aviator will change his direction so as to leave the other post on his other side. The circuit will thus consist of an uninterrupted series of figure eights, each circle of the figures alternately encircling one of the posts. The distance credited over the course covered between two turns shall be the distance separating the two posts.

For each of these three tests the landing shall be made:

(1) By stopping the motor not later than the time when the machine touches the ground.
(2) At a distance of less than 50 meters from a point designated by the applicant before the test.

Landings must be made properly and the official observer shall indicate in his report the way in which they were made, the issue of the license being always discretionary.

Official observers must be chosen from a list drawn up by the governing organization of each country.

SPHERICAL BALLOON PILOT.

Only the organization governing ballooning in each country represented in the Federation Aeronautique Internationale shall have the right to issue the license of Spherical Balloon Pilot to applicants of at least 18 years of age and under its jurisdiction, to wit:

I. Citizens.
II. Foreigners of a country not represented in the F. A. I.
III. Foreigners of a country represented in the F. A. I. (but in this case a license may be granted only with the permission of their own National organization).

Applicants must pass the following tests:

(A) Five ascensions without any conditions.
(B) An ascension of one hour's minimum duration undertaken by the candidate alone.
(C) A night ascension, with the understanding that if the start takes place before sunset the landing must be effected after midnight, and if the start takes place before midnight, the landing must be made after sunrise.

The issue of a license is always discretionary.

DIRIGIBLE BALLOON PILOT.

Only the organization governing dirigible ballooning in each country represented in the Federation Aeronautique Internationale shall have the right to issue the license of Dirigible Balloon Pilot to applicants of at least 18 years of age and under its jurisdiction, to wit:

I. Citizens.
II. Foreigners of a country not represented in the F. A. I.
III. Foreigners of a country represented in the F. A. I. (but in this case a license may be granted only with the permission of their own National organization).

The applicant must:

(A) Hold a spherical balloon pilot's license.
(B) Furnish proof of having made six voyages in a dirigible balloon on different dates, of which one, at least, must have been of an hour's duration, and on at least three of these occasions the dirigible must have been handled by the candidate himself.

The application for a license must be endorsed by two Dirigible Balloon Pilots who have witnessed at least three of the starts and landings of the candidate.

The issue of a license is always discretionary.

Address of Allan A. Ryan, President of the Aero Club of America,

January 6, 1911

The astonishing progress in aeronautic achievement of the last two years and the even greater advancement that is bound to come, places at this time a certain burden of responsibility upon the Aero Club of America, and if we are to do our patriotic part in aiding this country to reach and maintain the position it should have in this great enterprise, there is an immediate necessity for energetic and concerted work from now on.

If my interpretation of the purpose and scope of this club are correct, it is our duty to develop and advance in every legitimate manner, the science and the sport of aeronautics and to make these things the first and paramount business of the organization, and in that connection it is very gratifying to know that every requisite facility and resource for the accomplishment of this work is within the reach of the club, it being necessary now merely to enlarge and extend the institution already well established.

What is the Aero Club of America? It is, or it should be, exactly what its name implies. Not simply the Aero Club of New York City, or New York State, or any other one section of country or one group of men, but an organization as broad as the country itself and an organization that shall embody and give representation and expression to every affiliated aero club on this continent.

The science and the sport of aeronautics, in this country, as elsewhere in the world, have developed with a magic-like rapidity that has defied thus far all effort at organization and systematic control. The whole business seems to be up in the air higher even that the aviators themselves and the work before this club, is to do its part in getting things down to earth where we can begin to establish some sort of a system and control.

To accomplish satisfactory results along these lines we must have cordial and permanent cooperation of all interests concerned. The affiliated clubs of the entire country must work together and the first thing to do is to find some substantial basis upon which that policy can be carried into effect. To be more specific, it is my notion that every club and every active locality in America should be fully represented in the organization. I don't care whether each affiliated club is represented by one or by forty governors on the board, so long as we can establish a harmonious and effective organization that shall represent the aeronautic interests of the whole country, in fact, as well as in name. What we are after is results. We are all striving for the same thing, substantially, the upbuilding and systematizing of the science and sport of this country and we should waste no more time in petty differences and trivial details in getting on the main job.

This business of aeronautics is no longer the special field of cranks and idlers. It is a game that men are going to play from now on and we might as well understand, too, that it is a game that no one section of the country is going to monopolize. New York, Chicago, St. Louis, Kansas City, San Francisco and every other center in the United States is going to have its strong aero club, its aviators, its aviation fields, its special interests and enterprises and the question now is whether we all are going to work together as one happy family of the air, or continue to work apart with more or less waste of energy and opportunity, as has been done in the past.

It is my own belief that the future supremacy of this country in the aeronautic field is going to depend very largely upon the harmonious cooperation of the institutions and individuals interested in the great science and it seems to me that the time has arrived for us to decide upon that course and get to work. Naturally, the Aero Club of America should stand as the nominal head of the great national federation of clubs. It was the beginning of the aeronautic movement in this country; it is the natural representative of the International Federation and the natural parent body in the great group of American clubs. While I believe that the Aero Club of America should remain as the central and nominal head of aeronautics in this country, I believe that it should be so organized or reorganized as to give the fullest representation to every section of the country in control of all national policies and affairs.

It is also very important in the future that we give every possible aid and encouragement to worthy inventors and to every branch of scientific development in this country and to that end we should call into association and co-operation with us all those who are seriously working, or interested in the field of American aeronautics.

A very casual survey of the world at large shows that there is much to be done in America to bring us abreast of any other countries and the only way to achieve that result is through wise and effective cooperation. Organization and effort are alone necessary. The natural resources we have in abundance.

In Honor of Octave Chanute.

Speech of Hudson Maxim at the meeting of the Aero Club of America at the rooms of the Aero Club, Engineers' Building, New York City, January 6, 1911, the Aeronautical Society, the Automobile Club and Engineers' Club participating.

When men unite to do honor to greatness, they but perform a just duty and meet a just obligation, both to the man they honor and to themselves.

Great inventors, discovers, scientists, philosophers, are men who stand a little in advance of the world and help pull the world after them. The merit of what they do is seldom appreciated or recognized until the world has caught up. The inventor must, of necessity, work in new fields untrodden by his fellows; and both the manner of his working and the things he does, being new, are just to that extent unfamiliar to the masses of mankind; and just to the extent to which they are unfamiliar, is their

ALLAN A. RYAN, PRESIDENT AERO CLUB OF AMERICA

acceptance delayed and their merit unrecognized until the world catches up.

Octave Chanute was the veritable father of aviation, and he was always, in all things, a vedette of progress. He was one of those whom duty send far to the fore, where, unaided and lonesome, they make their landmarks, beckon their fellows to follow, and move further on; and, when the world comes up, then, and not until then, are their landmarks seen to be true and their labor found to be worth while.

Chanute was the Chief Engineer of aviation. He was inventor, mechanician, and mathematician. He had the courage of his convictions, for they were born of scientific knowledge and experience. Long before he began to pave the uncharted sky-way with mathematical equations, Chanute was a master spirit of rapid transit and practical transportation. He was one of the Vulcans who hewed the hills down for the roaded thunders of locomotion.

Chanute was one of those rare intellectual giants big enough and generous enough to endow other inventors and workers with his knowledge and to lend a hand to help them utilize it, and all without jealousy or envy. Aviation was a thing dearer to his heart than any self-greatening. It is gratifying to know that before his lamp of life went out he had the satisfaction of seeing fairly accomplished that master achievement which he had so generously patronized and for which he had so long labored and prayed—the conquest of the air.

CHARLES JEROME EDWARDS, TREASURER AERO CLUB OF AMERICA.

It is easy enough now, when we review what has been done, to see how it was done, but it took genius to foreknow the advent of aviation and in imagination to foresee the actual aeroplane soaring in the coming sky, and it took courage to face the ridicule of unbelief and the sneers of ignorance.

Chanute forsaw it all. He knew that mechanical flight was surely to be accomplished. He was one of the biggest and bravest of those whose labors finally launched the airship, and raised the eyes of doubt to behold accomplishment hung in the cloud, turned ridicule to wonder, the sneer to the loud bravo.

Now, when it looks so easy, it is hard to realize that, but a few years ago, any serious talk about aviation was a thing to be whispered in secret. The sure fulfillment of recurrent prophecy by repeated disaster made the immortal Darius Green of Trowbridge a symbol and a type of the flying machine inventor.

As the great human throng goes parading by in the avenue of life, it is a strange procession. First come the pioneers—discoverers, inventors, scientists, philosophers—a scattered few who clear the way. At their heels, and dogging them, are the standard bearers of ignorance, and the drum-beaters of prejudice, with their dancing, gibing, jeering, knaves, clowns and fools, making huge sport of their uncomprehended leaders who are clearing the way for them. These scoffers take nothing seriously which they do not understand. They do not understand their pioneers, and so they treat them as a joke.

CORTLANDT FIELD BISHOP, VICE PRESIDENT AERO CLUB OF AMERICA; VICE PRESIDENT FEDERATION AERONAUTIQUE INTERNATIONALE; VICE CHAIRMAN NATIONAL COUNCIL.

In the middle of the procession, we see men with books in their hands. They are finding out the meaning of what their great men did when they passed along. Later, we see men waving banners, playing music, singing songs, and cheering in honor of their great pioneers who have preceded them. There are but few, even among these, who actually understand the merit they are cheering. They know only that it has become a creditable thing to praise and honor now, instead of to scoff.

From the viewpoint of present accomplishment, aviation is an amazing triumph of human ingenuity and perseverance; but still more amazing is the almost inconceivable bravery of our aviators.

There have never been in any war, even where heroism made a nation's glory, braver men than are our flying heroes of today, who are so nobly fighting to conquer and subordinate the sky to man's use. One brave fellow after another loses his life. Heroic Johnstone plunges to death, and his friendly competitor, Hoxsey, all undaunted, climbs a screaming hurricane to a height of more than two miles. Such heroism makes us readjust and raise our respect for human nature.

When the old year died, and its last day's sun was falling in the western sky, our brave Hoxsey and our brave Moisant too, both fell, companions in its fall; and the world bows its naked head, and its tears are not for the dead old year, but for its heroes dead.

The passion for flight has in every age burned in the human heart. Paleolithic man looked with

ROBERT J. COLLIER, CHAIRMAN NATIONAL COUNCIL.

envious eyes upon the eagle's flight, and wondered at the disfavor of his Maker in having foot-tied him to earth, while to the birds had been given the winged freedom of the air; and man began then to think upon the problem of aerial navigation.

In spite of his prowess and his cunning, man was obliged to make his miles with slow-paced weariness, while the dove could wing its way as freely as the flight of thought.

When man beheld the mystery of life forsake the tired clay at the earth-journey's end, love and hope made him follow in his imagination the flight of that departed life into a spirit world, which he substantialized and visualized. He there gratified his passion for flight by giving wings to the immortal spirits of his dead, and he honored his great heroes by making them winged gods. He who first plumed himself for flight and essayed the navigation of the air had a god for his model.

All of the old-time aeronautical inventors had to combat two very strong forces—the antagonism of contemporary prejudice, and gravitation.

To the minds of all the bone-headed wiseacres of the past, human flight was palpably impossible—not only impossible, it was a wicked thing for man to try to invade the empire of the birds. Had God intended man to fly, he would have given him wings.

GEORGE F. CAMPBELL WOOD, SECRETARY AERO CLUB OF AMERICA.

Just as every innovator who has found one sphere of action too circumscribed for him, and broken out of it into broader fields of endeavor, has been obliged to face prophesied disaster, and the old admonition, "Shoemaker, stick to your last!" so the first aviators were advised to stick to their earth.

There has always been proof enough that the conquest of the air was an utter impossibility. Had it not been for the few big, progressive spirits in every generation who have undertaken the palpably impossible, and continually accomplished it; had it not been for the few, the courage of whose convictions was great enough and the sense of whose duty was dominant enough to face the sneers of envy, the ridicule of prejudice and the opposition of ignorance, our dwelling would still be a cave in the hill, our electric light a pitch torch, our library a few rude pictures and hieroglyphics scratched on the ledge wall; and the *piece de resistance* of our banquet some tough old patriarch slaughtered and put to his last use.

Always it has been a devoted few who have stood in the vanguard and fought the hard fight of progress.

One of such few was Octave Chanute. He belonged to the true nobility of brains. He was a man to make the constellated eyes of heaven look our way and honor us, and the gods to boast of kinship.

Aero Club of Connecticut

BY S. H. PATERSON

On December 29th in New Haven the Aero Club of Connecticut was formed for the purpose of promoting Aeronautics in the State, and while nothing definite has been planned as yet, the Club hopes to obtain suitable site of ground and one or two machines, with which experiments will be made. Below I give you the names of the officers and members of the different committees in which you will note the names of a few well known in the Aero world.

President, A. Holland Forbes of Fairfield.

First Vice President, W. C. Beers, of New Haven

Second Vice-President, Alton Farrell, of Ansonia.

Third Vice President, Clarence E. Whitney, of Hartford.

Secretary, Gregory S. Bryan, of Bridgeport.

Treasurer, Arthur H. Day, of New Haven.

Board of Governors, Frank V. Chapman, of New London; Hiram P. Maxim, of Hartford, and John B. Burrall, of Waterbury.

Consulting Engineers, H. P. Maxim, chairman; A. L. Riker and E. F. Gallaudet.

Contest Committee, A. Holland Forbes, chairman; F. V. Chappell, Alton Farrell, Walter Wheeler and Richard Crane, 3rd.

Membership Committee, F. V. Chapman, chairman; W. C. Beers and Herbert Pease

Law Committee, Samuel E. Hoyt, chairman; H. B. Stoddard and William C. Beers.

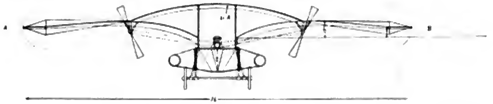
Auditing Committee, D. Fairchild Wheeler, chairman; T. H. Macdonald and Clarence G. Spaulding

Aero Club of America

At the meeting of the Board of Governors of the Aero Club of America on December 20th, the resignation of Mr. J. C. McCoy as first vice-president of the Club and as a governor, was presented and accepted. Mr. Cortlandt Field Bishop was elected first vice-president to succeed him and Mr. Robert Collier as governor.

THE STOKES MONOPLANE No. 3

(Patent Pending).



In the sketches the main planes No. 1 and 2, are curved with a certain Radius for about two-thirds of their length from the center outwardly, the remaining length being nearly straight, corresponding with the shape of a gull's wing when soaring.

The third curved plane arched over and connecting the two main planes acts as a brace as well as gives an additional sustaining surface.

The small planes at the ends of the main planes are moved if necessary by the hand wheel to increase more or less the curve of the under side of the main planes in a lateral direction.

Fore and aft balance is taken care of by the elevators connected together and operated by a simple hand lever convenient to the right hand of the aviator.

As the end planes are only occasionally used, they are connected to and operated by the hand wheel to which is also connected the throttle and spark lever—operated by the left hand of the aviator.

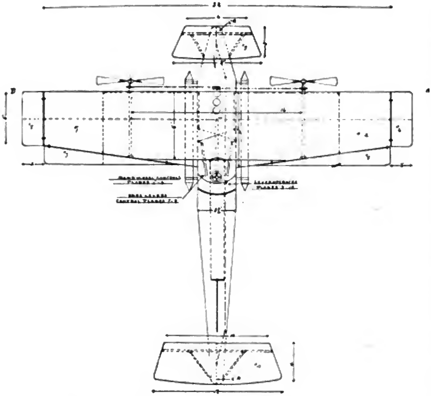
Lateral balance is accomplished by the auxiliary planes No. 6 and 7, operated by the knee levers, the lever on right side being connected with planes on opposite side and vice versa.

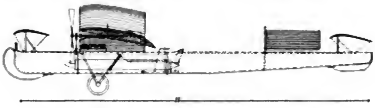
Steering is done by the feet through a simple yoke arrangement.

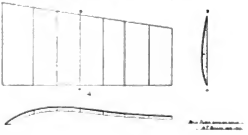
The machine has a boat shaped frame or fuselage and is provided with floats for use over water. With a 50 h. p. motor the machine weighs about 800 lbs., and may be modified for use as a one or two passenger machine or racing simply.

The sketches merely give a general idea of the shapes and general design, without details, etc.

Any information regarding the machine will be given to responsible parties with pleasure by the owner and inventor, H. S. Stokes, 48 Spring Street, Newark, N. J.







FIELD APPARATUS

By Henry A. Wise Wood

In nothing is the youthfulness of the sport of flying so apparent as in the unsuitable nature of the field appliances in use. This was particularly well illustrated during the course of the Boston and Belmont Park meets. While the airplane itself is receiving a degree of attention at the hands of the engineering world that probably no other invention ever has had, the work of developing its accessories upon the flying field seems to be almost wholly neglected. It is in order to direct attention to the subject, and to suggest some means of betterment, that the writer here raises the point. The plane-driver himself must be assisted to the utmost in his work, as well as those who are charged with correctly conducting officially-controlled meets.

The Belmont Meet may be drawn upon for instances. The cross-country event consisted of a flight from the starting line, around a given mark outside the course, nine miles away, and return, the prizes to be awarded the flyers making the fastest passages. The outer-mark consisted of a captive balloon held, it was announced, three hundred feet above ground; and a map of the intervening country, showing both line and mark, was exhibited at the starter's box. Notwithstanding these precautions experienced flyers failed frequently to find the outer-mark—and several far overflew its position. This latter Moisant did, while Latham returned twice without having seen the balloon. Nevertheless, it is interesting to know, Latham upon the last occasion had so accurately gauged his distance and direction that he was reported by the observer on the spot as having made his turn directly above the mark.

When flown against a bright sky a balloon, of course, is an easily discernible object and, therefore, a good mark; but flying nowadays—even 'cross-country flying—is done at such heights that a balloon must be set at an extraordinary altitude to appear in the airman's sky at all. For the homing beacon of the Statue of Liberty flight another device was tried, a column of tar-smoke. As this was blown low and flat by the wind, its efficiency was plainly questionable. Orville Wright told the writer, who had the beacon in charge, that he had tried smoke without success. He said that while it might appear to be dense and sharply-outlined when looked at from beneath, it was in reality, when sought for from a height, too thin to be of service. In France sheets spread on the ground are used frequently, but these do not fulfill the purpose of what is most urgently needed, a compelling horizontal mark—one that will command attention while still a long way ahead of the flyer, and remain obtrusively visible until he has reached and turned it. The flashing mark used in rough-water racing embodies the requisite qualities. Were a number of mirror-faced pyramids to be swung, by swivels at their apices, from the cord of a balloon, or of a fleet of kites, say fifteen feet apart, they would constitute a most admirable mark. Even upon gray days, or well towards dusk, such a mark would still be effective, while, when set against the earth as a background, its contrasting flashings would provoke attention where, monotonous and immobile, a balloon would merge into the landscape beyond or beneath, as it assuredly did at Belmont, and be lost. After-dark flying presents its special problems, but that of an effective distant air-mark may be solved by the obvious substitution of incandescent lights for pyramidal mirrors, supplied, over light-weight cables, with current from a storage-battery beneath.

Another subject requiring attention is that of lap-scoring. During the Gordon-Bennett race the flyers were disturbed lest they should lose count of the air-laps flown, or fail to make a correct count owing to the infliction of penalties of which they might not have been made aware of while flying, and ground before having made the allotted twenty laps. So it was agreed that each should fly twenty-two laps by way of good measure—a burden that should not have been imposed. Assuredly it was too much to ask of a flyer, working under the severe stresses of such a contest, to keep his own score. Plainly the time has come when a lap-scoring apparatus, its letters and figures large and distinct, should be spread on the ground and worked for the sole use of the flyers themselves. Such a device, to be satisfactory, must display the name or number of each contestant, the record of his laps accomplished, and the extent of his penalties, if any. It also should state the precise nature of the event in which he is flying. This having been done a man can settle down solely to the work of flying, and completely discharge from his mind the anxieties attached to keeping his own tally. An efficient lap-scorer can be made up in the following manner: Construct beside the track a platform having an inclination toward the direction of on-coming flight of about thirty degrees above the horizontal position. Arrange downwardly, upon its lefthand side, a column of panels each large enough for the name or number of a flyer, painted in black letters about forty inches high. To the right of this column place five others, the first headed, "LAPS;" the second, "PENALTY," and the third, fourth, and fifth, "HOURS," "MINUTES," "SECONDS," respectively. In each of these five columns, opposite a name-panel, insert a roller-curtain of suitable material bearing in block figures, forty inches high, the numerals appropriate to that column. If the rollers of each curtain be connected together with a sprocket chain, and the chain carried out to a hand-operable crank set at one side of the platform, the precise position of each flyer, with respect to laps, penalties, or time may easily be kept before him. Furthermore, he will then have an inestimable valuable advantage, which he cannot now enjoy—he will know the score of his competitors and thus be able at all times to regulate his own work with precision. This will lead to better flying and to greater safety. If the minute and second curtains be split and each half, arranged with numerals from nought to nine, be moved independently of the other, changes can be made with great rapidity. By having the name-panels removable, so that only the names of those engaged in any particular event need occupy the platform at the same time, a less bulky apparatus will suffice. An added panel-column at the right-hand side of the platform is desirable for the display of official notifications—such, for instance, as "YOU ARE FOULING MARKS," "YOU ARE FLYING FOUL," "RECROSS THE LINE," "COME DOWN AND REPORT," etc.

While the devices used for timing on the flat—a wire and a stop watch—have served reasonably well up to the present moment, it is obvious that they are not at all adapted to what soon must become extremely complex and difficult work. Expert clockers, standing beneath a wire, may perhaps easily take time of a passing airplane moving at present-day speed—but let three or more machines, flying at different heights and in the eighties or nineties of speed, finish in a bunch, and it is safe to say that no man, nor men acting together, nor any existing device, could record their respective positions and times with accuracy. The sport has but little further to go in its development ere this very situation will arise to be dealt with, for the attainment of ever-higher speeds and closer finishes is rapidly progressing. In order to aid this forward movement, by enabling its results to be recorded with ease and precision, the writer had devised an automatically recording aerial timer for use in the field. By means of this apparatus airplanes crossing the line may be recorded photographically in their positions with respect to the line, and each other; and the hour, minute, second and fraction thereof, of the crossing of each, will be recorded simultaneously upon the plate. Thus the uncertain human equation may be eliminated from the most important of all field functions, and the possibility of many troublesome disputes—and disputes occasionally become international—precluded, by the substitution of an indisputable permanent visible record. All that is required consists of a moving-picture camera, fitted with photographically recording glass time-dials, and a suitable arrangement of "line" wire. To a moving-picture camera, constructed to make an exposure of about twice the usual size, fit a time-piece so arranged that its hour, minute, and second arbors are not placed at the same center, as is customary, but side by side instead. Upon each arbor place a thin, circular, glass disk opaquely engraved, the first with the hours, the second with the minutes, and the third with the seconds, and their fractional divisions. Position these disks to overlap an edge of the film when in its position of exposure, then wind and set the time piece, and the apparatus is ready for use. To provide the necessary "line," at one side of the course, fifty or a hundred or more feet away, raise a pole, and from its top run a bulky iron wire downwardly toward the course, at an angle of forty-five degrees. Beneath this wire, and parallel to it, run another similar one at a distance of five or more feet, and stake both tautly to the ground. These wires and the pole, which may be termed a timing-harp, must be so positioned that the triangle they describe is plumb, and its plane, if projected, will cut the flying-course precisely at right-angles to the line of flight. The photographic timer should then be placed within this triangle, so that both wires appear as one in its field of vision and thus become the official "line." The operation of timing is as follows: A fleet of airplanes is seen approaching the line, when the official timer begin cranking the camera and continues till they have passed. The strip of exposed film is then quickly detached, by means of a simple "dark room" device which is part of the camera, and is developed on the spot, when there will appear upon each exposure the line, the machines in its immediate neighborhood, and the precise time of passage of each machine printed in hours, minutes, seconds, and fractions thereof. By this means the relative positions of all contestants at the finish of an event may be accurately ascertained and permanently recorded, and the exact time of finish by each be found and placed beyond dispute. If the camera be mounted at a sufficient distance from the course, but one such apparatus should be required to cover the necessary arc of sight; if it be not, two may be necessary. Glass-covered hands, or dials, corresponding to those within, should be visible from outside the camera, and all winding and setting devices should be operable from without. Thus the timer could be kept in regulation, and constantly checked for error. Given this apparatus, a properly constructed timing-harp, and large numbers clearly displayed upon the tails and beneath the wings of contesting airplanes, and every start, lap and finish of the most intricate event—so long as daylight served—could be timed and recorded with an accuracy not possible by any means now in use.

THE NEW YORK AERO SHOW

By W. H. Phipps

The most pretentious aero show ever held in America and the first one to be held in New York, took place at the Grand Central Palace as a part of the Automobile Show, from December 31st, 1910, to January 7th, 1911, and was in every way a complete success.

Twelve full sized machines were exhibited, including two of foreign make, while a large number of firms who manufacture accessories were also represented.

We append herewith a summary of the main features of the more important exhibits:

THE WRIGHT.

The Wright Brothers exhibited two of their latest headless fliers: a Wright "Roadster," used by the late Ralph Johnstone when, at the recent Belmont Park meet, he broke the World's Altitude Record, and a standard Model B. passenger carrying machine, built for Messrs. Frederick and Russel Alger of Detroit, a duplicate of which was used by Arch Hoxsey at Los Angeles when he rose to a height of over eleven thousand feet, making a new World's Record.

The Wright "Roadster" is a small single-seater copy of the standard headless flier—designed especially for speed and altitude work. With Orville Wright at the helm, it has climbed faster than any other aeroplane in the world. Wilbur Wright believes this machine capable of going two or three thousand feet higher than Hoxsey's record-breaker.

Its main dimensions are: Spread of planes, 26½ feet. Depth of planes 3 feet 7 inches. Fore and aft length, 24 feet. Height over all 6 feet 10 inches. Weight 585 lbs. The "Roadster" is fitted with two front skids and Farman-type shock absorbing wheels, while the tail is supported by two small springy skids.

The model B. passenger-carrying machine is little altered from the machine used by Hoxsey at Belmont Park, but there are several important detail alterations. The two front skids have been shortened and their points turned up at a sharp angle. The particular machine shown is an example of "show finish." All the steel parts are plated and the woodwork carefully varnished,—a departure from regular Wright practice,—aluminum paint having previously been used on all their machines.

The machine has both a foot and hand magneto control, and as the magneto is a Mea, an exceedingly wide range of control is provided. The control levers and their mountings have been materially strengthened by the use of special steel and aluminum fittings, which are necessary, owing to the complicated operation of the combination wing-warping and rear rudder control lever. The entire machine is governed by two levers, the first of which, when moved forward or backward, warps the wings and at the same time turns the rear vertical rudder, permitting the operator to maintain his balance without changing his course. The vertical rudder can also be operated independently to turn to the right or left by simply twisting the pivoted end of the lever with a wrist motion. The second lever warps the rear horizontal rudder either up or down, causing the machine to ascend or descend.

THE CURTISS BIPLANE.

Glenn H. Curtiss exhibited his famous Hudson flyer. The machine has been altered in several respects since his Albany-New York flight. A noticeable change is in the position of the ailerons which have been moved to the rear uprights. The most important change, however, is a new method of wiring the aileron controls, so that if one breaks or pulls loose, the other may be operated independantly to maintain the balance of the machine, using the existing one and counteracting the drag effect by the use of the rear vertical rudder.

Mr. Curtiss also exhibited a section of a new double surfaced biplane which he is building for speed purposes.

THE BLERIOT.

Moisant's famous Paris to London Blériot was on exhibition. This machine is a two-seater, fitted with a large flat pigeon tail. Drawings and a description of this interesting monoplane will be found on page 439 of this number.

BURGESS CO. AND CURTIS.

The Burgess Company and Curtis, had on show two very interesting biplanes, a large passenger Model D type, and a small single-seater Model C type.

The Model D is a large modified Farman type of unusual interest, as there are many new features and ideas embodied in its construction, one particularly noticeable feature being the placing of the skids very far apart and prolonging them up to the front rudder as on the old style Wright. There are no wooden members leading from the front elevator to the top main-spar as on the Farman.

The control on both of the Burgess-Curtis machines is unique. It consists of two universally jointed levers situated on each side of the pilot's seat, joined by a cross rod which passes in front of the operator and the whole so constructed as to enable the pilot to guide the machine with both hands—jointly or separately.

The control operates in the same manner as the Farman, with the exception that in this case provision is made to overcome the drag effect of the pulled-down ailerons. This is accomplished by the use of flaps on the upper side of the extremities of the upper planes; normally they lie flat; if, however, a gust of wind heels the machine over the ailerons are used to raise the low side, and at the same time and by the same movement the flap rising on the high side causes a resistance to that side, equal to the drag exerted by the ailerons on the left. Steering to the right and left is done by the feet. In other respects this machine differs but little from the regular Farman.

The main dimensions of the Model D are: Surface, 536 sq. ft. Weight, 700 lbs; motor, Hendee 8 cylinder, 60 H.P.; propeller, 8 ft. Burgess.

The Burgess-Curtis Model C. is a single-seater biplane of about the same dimensions as a Curtiss. In this model the skids are spaced a considerable distance apart and extend up to the biplane front rudder. The running gear consists of two small wheels on an axle attached to the skids by rubber bands à la Sommer. The control is the same as used on the Model D. The general dimensions of this machine are: Surface, 290 sq. ft. Weight 450 lbs. Motor, 2-cylinder, 30 H.P. Clement-Bayard. Propeller, 6½ ft. Burgess.

"DEMOISELLE."

A Santos-Dumont "Demoiselle" monoplane which was being reconstructed and strengthened to hold a 50 H.P. Gnôme, was shown by Capt. T. T. Lovelace, late of the English Humber firm.

It is to be flown by Roland Garros, and should make some splendid speed records.

The machine shown was constructed almost entirely out of steel tubing and was fitted with a Requa-Gibson propeller, the surfaces being double surfaced and very rigid. We await with interest the trials of this machine.

THE WITTEMANN BIPLANE.

Messrs. C. & A. Wittemann, of Staten Island, exhibited one of their standard gliders and a two-seater aeroplane which fairly bristled with new and novel ideas.

The large machine has the wings set at a dihedral angle and the ailerons are attached to the rear uprights at the same angle as the main planes. Special steel upright sockets are used in place of the aluminum ones formally fitted to the Wittemann machines. As may be seen from the sketch, the elevator is supported by two stout booms running aft and suitably braced with wire. The landing gear consists of a combination of skids and shock-absorbing wheels.

The chief novelty of the machine lies in the construction of the tail which somewhat resembles the Blériot XI type, with the important difference that the central position is movable and interconnected to the front elevator, while the two extremities are rigid. The machine is fitted with an Elbridge 40 H.P. motor and a Requa-Gibson propeller.

THE WALDEN-DYOTT MONOPLANE.

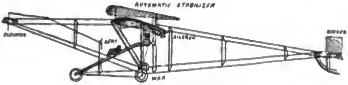
Messrs. Walden & Dyott exhibited one of their front rudder monoplanes. The machine has one large main bearing surface and a small fixed tail, and is steered up or down by a small single plane front rudder.

The pilot sits below and slightly in front of the main plane with the motor situated behind him as in the Curtiss. The running gear and under chassis is similar to that used on the Curtiss. The control is operated by a Curtiss-type wheel and pillar, which in this case can, however, be pushed to the right and left, to operate the Farman-type ailerons.

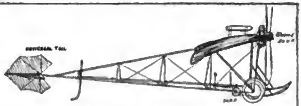
As an aid in securing automatic side balance a spindle shaped vertical fin is fitted on the ends of the main plane. These fins are set at a dihedral angle to each other.

The monoplane is fitted with a 25 H.P. Anzani motor and a Requa-Gibson propeller. A novelty noticed on the machine was a small instrument for showing the angle at which the machine was flying.

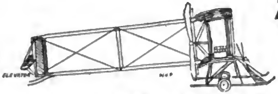
TYPES OF MACHINES AT THE NEW YORK AERO SHOW



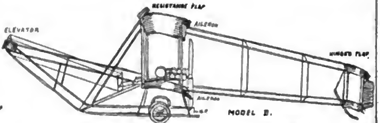
THE WALDEN-DYOTT MONOPLANE



GNÔME — "DEMOISELLE"

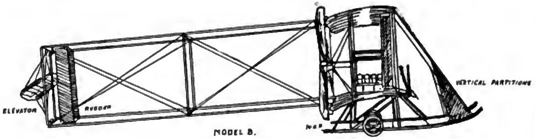


THE WRIGHT ROADSTER

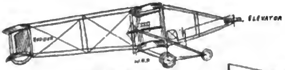


MODEL B.

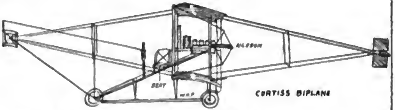
THE BURGESS COMPANY AND CURTIS BIPLANE



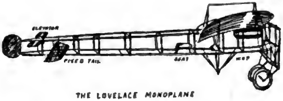
MODEL B.
THE WRIGHT BIPLANE



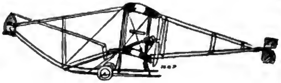
THE VAN ANDEN BIPLANE



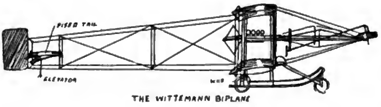
CURTISS BIPLANE



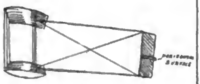
THE LOVELACE MONOPLANE



THE BURGESS COMPANY AND CURTIS BIPLANE
MODEL C.



THE WITTEMANN BIPLANE



WITTEMANN GLIDER

THE VAN ANDEN BIPLANE.

The Van Anden biplane resembles the Baldwin biplane illustrated and described in the July Aircraft, (page 183). In general outline this machine resembles a combination of the Farman and Curtiss. Ailerons are fitted to the rear uprights as in the Curtiss Hudson flyer. The machine is fitted with a 40 H.P. motor and Requa-Gibson propeller.

THE LOVELACE MONOPLANE.

The Aeroplane Sales Company, exhibited a monoplane built by Capt. T. T. Lovelace. This machine was only partially finished, being without motor and covering. In general appearance it resembled a cross-channel Blériot, but is fitted with two separate tails as on the Blériot XII., one a fixed surface, the other an elevator.

THE VALANAUT CONSTRUCTION CO.

The Valanaut Construction Company exhibited a Curtiss-type biplane of excellent workmanship. All the fittings were nickel plated and of good construction. The motor used was a 40 H.P. Aeromotor.

Besides the above machines there was a fine exhibit of accessories, motors and parts. The Gnôme motor attracted considerable attention as did the gyroscope used for stability on the Beach monoplanes.

The gyroscope is fitted with a 12-inch wheel which makes 10,000 r.p.m. in a vacuum. The weight complete is 30 lbs. and it offers a resistance of 1,000 lbs. By throwing a switch, it can be put out of action when machine is making a turn, thus allowing it to bank.

Below we append a list of the exhibitors.

EXHIBITORS.

SECOND BALCONY, (Right Aisle.)

The Flyers Club.
W. H. Aitken.
The World.
Cole & Co. Aero Postals.
The Aeronautical Reserve.
E. J. Willis Co. Parts and Supplies.
Fox Aero Motors.
C. & A. Wittemann biplane.
McAdamite Metal.
Acme Propellers.
The D. & F. Radiator Co.
The Walden-Dyott Co.
The Hall-Scott Motors.
Burgess Co. and Curtis.

(Centre Aisle.)

Detroit Aeronautical Construction Co. Motors.
The Aeroplane Sales Co.
Moisant's Blériot.
Capt. T. T. Lovelace.
Roland Garros' Demoiselle.
The Curtiss Exhibit.

(Left Aisle.)

The Aeronautical Society.
Scientific Aeroplane Co.
The Valanaut Construction Co.
The Elbridge Engine Co.
The Louis L. Crane Mfg. Co.
C. B. Kirkman. Motors.
Anzani Motors.
American Aeroplane Supply House.
Van Anden Biplane.
Requa-Gibson Propellers.
Paragon Propellers.
American Metal Fusing & Cutting Co.
The Wright Co.

CONSTRUCTION DETAILS OF MACHINES AT THE SHOW

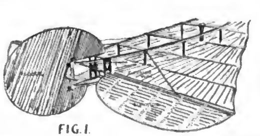


FIG. 1.

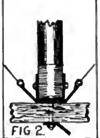


FIG 2.

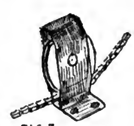


FIG. 3.

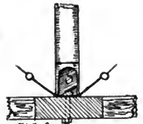


FIG 4.

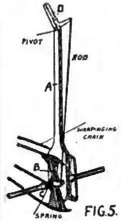


FIG. 5.

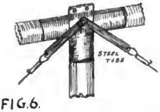


FIG. 6.

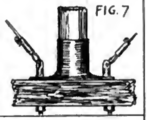


FIG. 7.

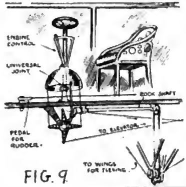


FIG. 9

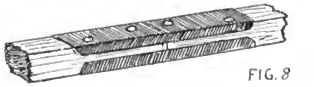


FIG. 8

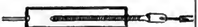


FIG. 10.

W. H. P

Fig. 1.—Shows the general construction of the pigeon tail and elevator on Moisant's two-seater Blériot.

Fig. 2.—Illustrates a rigid upright joint on the Wright machine. The upright is held by a piece of strip steel which is bolted to the main spar as shown.

Fig. 3.—Shows the construction of one of the Wright warping pulleys. This pulley is situated near the pivoting joint of the rear main spar and has to withstand enormous strain.

Fig. 4.—Shows a joint used in the construction of the tail outrigging of the Wright biplane.

Fig. 5. Illustrates the construction of the combination wing warping and rear rudder control fitted to the new Wright machines. The wooden lever A, controls the warping, while the aluminum attachment B, works the rear rudder. The control is so constructed that the attachment B. is held by the spring C. tightly up against the flat side of the lever A. so that when the lever A. is pushed back and forth the attachment B. also moves, thus turning the rudder to the right or left and counteracting the steering effect of the warped planes. If, however, it is desired to operate the rear rudder without the warping, the handle D. is twisted to the right or left by a wrist motion. The pressure of the spring is not great enough to offer much resistance to this movement.

Fig. 6.—Shows a joint used on the Walden-Dyott monoplane.

Fig. 7. Shows a steel upright socket used on the Wittemann biplane.

Fig 8.—Illustrates the control of the Moisant two-seater Blériot.

Fig. 9.—Shows a method of joining two spars as used on the Wittemann biplane.

Fig. 10.—Shows a turnbuckle used on the Wright control wires. It is made from a piece of heavy sheet steel and a 3-16 inch stove bolt.

COMPARISON OF BLERIOT TYPES

By John Jay Ide

THE BLERIOT XI bis.

In the autumn of 1909, Léon Delagrange bought a standard Cross-Channel Blériot, built to receive a 25 H. P. Anzani engine, and fitted it with a 50 H. P. Gnôme. On December 30th, he made a flight of 125 miles in 2 hours 32 minutes, at that time a record for monoplanes. The fatal accidents to Delagrange (January 4th, 1910) and to his pupil Le Blon (April 2nd, 1910) may be traced to the overpowering of their machines.

The first Blériot especially built to receive a Gnôme motor was delivered to Jacques Balsan in November, 1909. He flew for over an hour before the end of the year. Thereafter the Gnôme-Blériot carried all before it.

At Rouen (June 17-26) Cattaneo on the XI bis, won the speed prizes and was second, with 460 miles, to Captain Dickson, in the total distance flown.

At Rheims (July 2-10) the Blériots captured most of the events. Olieslaegers flew 244 miles in 5 hours 3 minutes (at that time the world's record for distance and duration), and Leblanc was first in the Gordon Bennett Eliminating trials.

The Blériot XI bis type de course made its début at Rheims and, driven by Morane, it broke the speed records for 5, 10 and 20 kilometers, doing the 20 kilometres at the rate of 66 miles an hour. This machine has two feet less span than the regular XI bis and is equipped with a 100 H. P. Gnôme.

The Circuit de l'Est (August 7-17) was a triumph for the Blériots. The two monoplanes driven by Leblanc and Aubrun were first and second respectively, the only other machine to reach Paris being Legagneux's H. Farman. Leblanc's elapsed time for the 500 miles was 12 hours. The Blériots in the Circuit de l'Est had skids in place of the rear castor wheels, and had flatter wings than previous machines. These improvements have been retained for 1911.

On Friday, September 23rd, Chavez made his memorable flight across the Alps from Brigue to Domodossola. His death was due to a wing collapsing, an instant before landing.

The splendid performances of the Blériots at Belmont Park last autumn will be readily recalled. In this meet the Blériots were the only machines that accomplished the Statute of Liberty flight, and the 100 H. P. Type de Course, driven by Grahame-White, won the Gordon Bennett Cup on account of the accident to the other 100 H. P. Blériot driven by Leblanc. The Frenchman's mishap was similar to that of Lancia in the 1905 Vanderbilt Cup. The Italian, it may be remembered, lapped every other competitor in the race, had the victory in his grasp, and then suffered a collision with the Christie front-drive machine.

THE BLERIOT XI. 2 bis.

The first fan-tailed Blériot was a single seater, brought out in January 1910, bearing the designation "No. XIII." Blériot conducted experiments with this machine until May but they were not very successful and no more one-passenger fan-tailed machines were built.

During the spring of 1910, a new two-passenger Blériot was built to take the place of the old Type XII, and this new machine, called the XI. 2 bis, was fitted with a fantail and a 50 H. P. Gnôme engine.

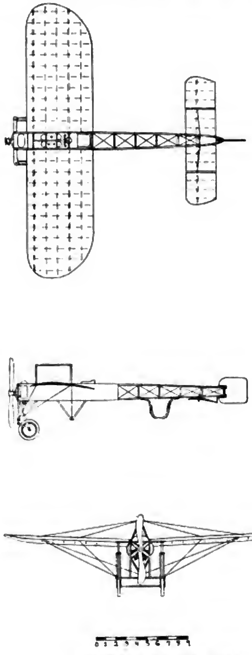
One of the first flights of the new monoplane was made by Léon Morane on June 8th, from Issy to Toury with a stop at Etampes (50 miles in 72 minutes elapsed time). With the same machine this pilot won the Height Prize at Rouen.

At Rheims, the two-passenger Blériots were driven by Aubrun, Mamet, and Morane. The first named carried one passenger 85 miles in 2 hours 9 minutes, the second carried two passengers 60 miles in 1 hour 38 minutes, and Morane was third in the height contest.

On August 7th, the late John B. Moisant flew from Etampes to Issy with a friend, to witness the start of the Circuit de l'Est; and on the 16th he started, with his mechanician Fileux, on his historic journey from Paris to London.

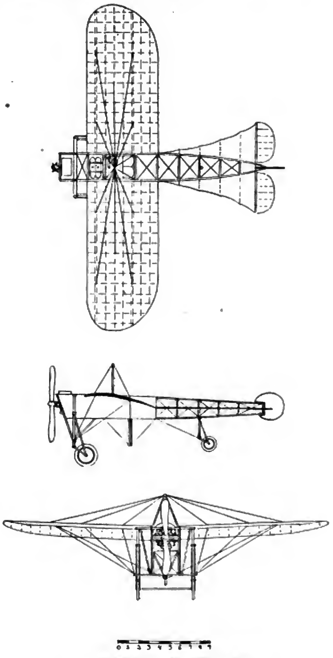
On October 5th, the brothers Léon and Robert Morane attempted to win the Michelin Prize for a flight from Paris to Puy de Dô Dôme. They left Issy on a Blériot XI. 2 bis, equipped with a 100 H. P. Gnôme motor. After forty minutes in the air, while passing over Boissy St. Leger, one of the control wires broke, and the machine fell, seriously injuring the two Moranes.

Recently M. Blériot has been experimenting with a new two-passenger machine, called Type XIV, the fuselage of which differs from that of the XI. 2 bis.



BLERIOT XI BIS. 1911

Breadth	28' 6"
Length	23' 6"
Wings.	
Spread	13' 6"
Chord	6' 6"
Total Area (approx.)	160 sq. ft.
Rudder	2' 11" x 3'
Tail	6' x 2' 11"
Total Weight (approx.)	550 lb.
Propellor (Chauvière)	7' 6"
Motor	Gnôme 50 H. P.
No. cylinders	7
Bore	110 mm.
Stroke	120 mm.
Weight	167 lb.



BLERIOT XI BIS. 1911

Breadth	32' 6"
Length	23'
Wings.	
Spread	15'
Chord	7'
Total Area (approx.)	190 sq. ft.
Total Weight (approx.)	770 lb.
Propellor (Chauvière)	7' 11"
Motor	Gnôme 100 H. P.
No. cylinders	14
Bore	110 mm.
Stroke	120 mm.
Weight	220 lb.

NEWS IN GENERAL

By D. E. Ball

HOXEY.

The last day of 1910 was a disastrous one for America, two of her most noted aviators losing their lives whilst flying their machines.

Arch Hoxsey, who had but a few days previously broken the world's altitude record in a climb of over eleven thousand feet, fell several hundred feet at the grounds of the Los Angeles, Cal., Aero meet, and was instantly killed—that is if he was not dead before reaching the ground—which is quite possible. Whether the fault was caused by some part of the machine breaking in mid-air or whether Mr. Hoxsey was suddenly afflicted with "mountain sickness" through the too rapid change of pressure in his descent, will never be known.

At New Orleans, on the morning of December 31, John B. Moisant, while testing his machine preparatory to making a flight for the Michelin Cup, was thrown out upon his head and instantly killed. This accident was caused by the over confidence of Moisant, who undertook to make a landing at too sharp an angle while traveling with the wind. The extra heavy gasoline tank used for this flight, by lowering its centre of gravity, increased the diving tendency of the Blériot, when the tail was struck by an upward gust.

SIMON, BARRIER AND HAMILTON WATCHING MOISANT'S DARING EVOLUTIONS AT NEW ORLEANS.

Captain Thomas Baldwin and J. C. Mars, both famous American aviators are now making a tour of the world giving flying exhibitions. Their itinerary includes trips through Hawaii, Japan, China, the Philippines, Africa and Europe.

Legislation for the regulation and protection of aeroplanes was adopted by the Pacific Aero Club recently, for submission to the State Legislature.

One series of measures is designed to safeguard the air men from exemplary damages for trespass. It is provided that when they find it necessary to land on private property they shall not be held liable for anything but the actual damage they do.

An amendment to the penal code is proposed making it a felony equivalent to attempted homicide to shoot at an aeroplane in flight.

Another bill provides for the licensing, registration and numbering of aeroplanes after the manner of automobiles. Under this law aeroplanes would be required to carry certain lights when flying at night.

WILLIAM M. HILLIARD FLYING ABOUT THE COUNTRY ON A BURGESS CO. AND CURTIS BIPLANE.

For the third successive year Glenn H. Curtiss has won the Scientific American Trophy, which was the first competitive prize offered for aeroplane flights in this country. Under the rules governing the award of this trophy Mr. Curtiss now keeps the cup.

In 1908, when the Scientific American first offered the cup, the rules called for the best flight of one kilometre, which Mr. Curtiss accomplished on July 4 of that year. In 1909 he again won the prize by a flight at Mineola, just prior to the international aviation meet at Rheims, France, when he was the first winner of the Coupe Internationale D'Aviation.

For 1910 the Aero Club of America decided to award the prize to the aviator making the longest continuous cross country flight in this country after formally giving notice of his intention to make the flight. Under these conditions the historic Albany-New York flight by Mr. Curtiss gave him claim to the prise for the third time.

MOISANT.

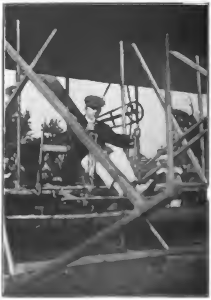
We observe quite frequently that newspapers or periodicals publishing aeroplane records give the speed record to Radley, who flew one mile in 47 2-5 seconds, or at the rate of 75.95 miles per hour.

It might be stated here that Radley accomplished this feat at Lanark, Scotland, last July. However, it is not a record, as it was made straightaway.

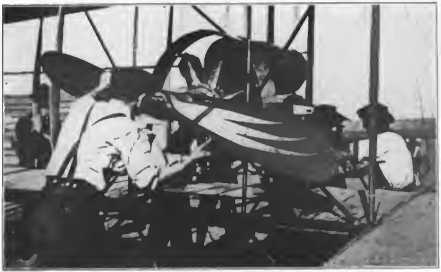
In a straightaway course, a machine would naturally go faster with a wind back of it, which, of course, was the case here. It is nothing short of absurd to put down Radley's feat as a record. One might just as well allow an automobile to make a record running down hill.

Page 359 (December AIRCRAFT) gives correct Speed Records.

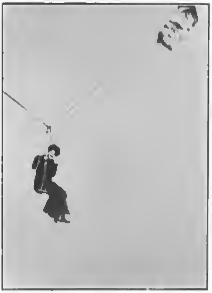
Dr. Sidney S. Stowell the noted balloonist of Pittsfield, Mass., was married recently to Miss Blanche Edith Hulse of Brooklyn. It is the intention of the pair to spend many of their honeymoon days ballooning among the Berkshires.



THE LATE ARCH HOXEY AS HE APPEARED WHEN ABOUT TO MAKE A SHORT FLIGHT.



CHARLES F. WILLARD'S GNOME DRIVEN BIPLANE FITTED WITH A PARAGON PROPELLER.



MISS MALLARD LIFTED 40 FEET IN AIR BY SAM PERKIN'S KITES.

On December 26th, at Los Angeles, Hoxsey rose to a height of over eleven thousand feet—a World's Record.

Falcon Joslyn and Thomas J. Nestor, two of the most successful mining men in Alaska, propose conducting experiments during the coming summer with the aeroplane, from Nome to the Squirrel River Diggings on Kolzebue Sound and other camps within the Arctic circle, as a means of transporting mails, rush orders and light freight. This scheme, if successful, will prove invaluable, especially in winter when travel over the snow and ice-covered Northland renders land locomotion well nigh impracticable.

The San Francisco Aviation Meet, January 7th to 16th, was accompanied with many interesting features: Rear Admiral Edward B. Barry, commanding the Pacific fleet and Brigadier-General Tasker H. Bliss, commanding the department of California, were ordered by the Navy and War departments to assist in the various tests. Several Army and Navy officers were also in attendance. The sum of $100,000 was raised by the committee as guarantee and prize money.

A bill has been prepared for introduction in the New Jersey legislature by J. Hood MacFarland, providing for State control of aviation.

A similar movement, the idea of Governor Baldwin, is on foot in the Legislature of California, and is obviously the outcome of the tragedies of aviation which marked the close of 1910.

At the Los Angeles meet (Dec. 24-Jan. 2), Hoxsey, Latham, Brookins, Parmelee, Radley, Ely, Willard and Curtiss were the stars.

Chester I. Campbell is more than sanguine as to the success of the Second National Exhibition of Air Craft to be held at Boston, February 20-25, of which he is manager. Many novelties are to be introduced and most of the prominent manufacturers will be represented.

On December 22nd, Hubert Latham in his Antoinette, flew from the Los Angeles Aviation field to the Bolsa Chico hunting grounds, a distance of ten miles, where he amused himself by shooting ducks from his aeroplane.

When the big monoplane flew over the slough, where the best shooting can be obtained on the preserves, water fowl rose by the hundreds. The throb of the motor caused consternation among the snipe, mudhens and ducks, which frequent this place.

After using all his shot, Latham chased the frightened birds out to sea for several miles before returning to the aviation field.

Some good flights have recently been made at Santa Barbara by Mr. D. Masson, who is flying a machine for N. C. Adossides. This machine is equipped with a Hall-Scott motor.

DOINGS OF CURTISS AVIATORS

Glenn H. Curtiss arrived at Los Angeles, California, on December 9, and began at once the organization of an aeroplane school and the opening of winter experimental grounds. Just before leaving for the western coast, Mr. Curtiss wrote the secretaries of the War and Navy Departments offering to instruct an officer from each free of all cost to the government. Both departments accepted the offer, and Secretary Meyer, of the Navy Department detailed Lieutenant Theodore G. Ellison to work with Mr. Curtiss. Lieutenant Ellison has for the past three years been in the submarine boat service at Newport News and is an enthusiast in submarine work, declaring that nothing but aviation appealed to him so strongly. He reported to Mr. Curtiss for duty at Los Angeles on January 4.

In connection with his other experimental work on the coast, Mr. Curtiss will conduct a number of tests to develop a machine especially adapted for the use of the navy, and Rear Admiral Barry, commander of the Pacific Squadron, has been instructed to co-operate with the aviator in these tests, making use of the vessels of the squadron whenever possible.

On December 10 Charles F. Willard made a daring cross country flight from Los Angeles to Pasadena, California, and return. The home-bound trip was made at an altitude of 3,000 feet and the route was over the entire city of Los Angeles, making the flight one of the most picturesque that has been made. Willard used his large model Curtiss biplane. Starting from a point west of Los Angeles, he flew directly over the business center of the city to a point over the center of Pasadena, and on his return he circled over the office of the Los Angeles Express, the newspaper which promoted the flight. The trip of fifty-five miles was covered in one hour and ten minutes.

On December 7 and 8 Eugene B. Ely and J. A. D. McCurdy participated in a two-machine meet at Columbia, S. C., both aviators making a number of flights each day. At this meet McCurdy acquired the "Spiral Glide," which he has been practicing since at all his engagements.

December 15-17, McCurdy, Ely and Jimmie Ward participated in an aeroplane tournament at Atlanta, Ga., held under the auspices of the Journal of that city. The meet was decidedly successful from a financial standpoint and many of the prominent citizens of the city voiced their approval of the flights through the columns of the Journal.

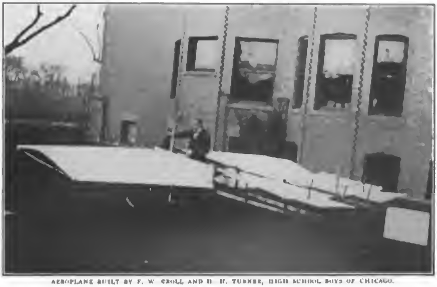
December 16-17-18 Charles F. Willard and Bud Mars participated in the meet held at Fresno, California, where they flew under the personal direction of Mr. Curtiss. Mr. Curtiss also attended and supervised the work of his aviators, Willard, Ely, Beachy and Robinson at the Los Angeles meet December 24 to January 3. It was at this meet that Lincoln Beachy, the famous dirigible balloonist, made his first appearance as an aviator, flying an eight cylinder Curtiss biplane as a regular member of the Curtiss team. At this meet Willard won $2,100 in prizes.

On December 21, McCurdy gave a flying exhibition at Dillon, S. C., receiving $1,000 for the day's flights although the entire population of the town is less than 1,100.

From Dillon, McCurdy went to Norfolk, Va., where on December 23 he made a beautiful flight over the city and along the entire water front over the river, the Norfolk Ledger-Dispatch being sponsor. On Christmas day, McCurdy and Ward flew at Jacksonville, Fla., under the auspices of the Times-Union.

Opening flights for the new year were made by McCurdy and Ward at Charlestown, S. C., under the auspices of the Chamber of Commerce on January 2 and 3.

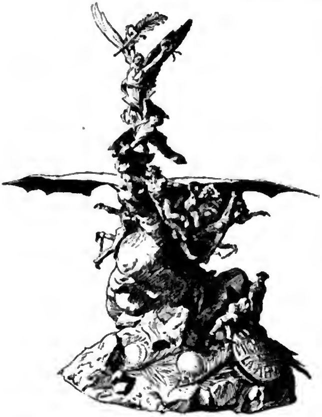
Beginning February 4, the Curtiss aviators, McCurdy, Ward, Post and Beachy will participate at a meet to be held at Havana, Cuba, under the auspices of the Havana Post and under the patronage of the Cuban government. The meet will be held at Camp Columbia, the parade ground of the government troops, and the army will police the field. A number of substantial cash prizes are to be competed for.



AEROPLANE BUILT BY F. W. CROLL AND H. H. TURNER, HIGH SCHOOL BOYS OF CHICAGO.

HISTORY OF THE MICHELIN CUP

By G. F. Campbell Wood



THE MICHELIN TROPHY.

IT was on March 7, 1908, that, under the heading of "Le plus gros prix du monde"—the largest prize in the world—*Les Sports,* one of the big Parisian sporting daily papers, published a letter from Michelin & Co., the Clermont-Ferrand manufacturers, in which they offered for competition among aviators the sum of $50,000. Of this total $20,000 was set aside under the name of "Grand Prix Michelin," and is at the disposal of the first aviator who, under official control, flies from the Aero Club of France grounds at St. Cloud, just outside Paris, to the Cathedral at Clermont and thence to the summit of the Puy de Dôme, the nearby mountain; he must carry a passenger and take less than six hours to perform the feat.

This was the event which the American aviator, Henry Weymann, competed for a few months ago, and came very near winning, beating all cross-country records in his effort.

It was also in an attempt to win this prize that Léon Morane, the famous French Blériot driver, sustained the serious accident, on October 5th last, which prevented his coming to America for the International Meet.

It may here be noted that the original rules gave the Arc de Triomphe, in the heart of Paris, as the "starting post," and that this was later changed so as to avoid giving official sanction to flying over Paris.

The remaining $30,000 was devoted to yearly competitions, and it is the winning of part of this gift, and the "Cup" or trophy which goes with it, that many aviators have in view at the end of every year.

At that time (March, 1908) the Wright brothers had been in comparative seclusion for two years and were believed in by but few people. The Anglo-French aviator, Henry Farman, had, less than two months before, won the Deutsch-Archdeacon prize of $10,000 by flying one kilometre in a closed circuit. This flight of eleven hundred yards, accomplished in one minute and twenty-eight seconds, was still the world's official record then, both as to distance and duration, and had been unapproached by Farman's rivals.

For the yearly competition, the first idea of the givers was to contribute for ten successive years a prize of three thousand dollars to the aviator making the longest flight of the year, as measured over the ground, and in accordance with rules made from year to year to fit the progress in aviation. A cup of a minimum value of $2,000 was also donated, to be held from year to year, by the club of the winner of the money prize, and to become the absolute property of the last individual winner on December 31, 1917, while a copy of the cup was to go to his club on this occasion. It was further stipulated that the prize would be open to aviators of all nations and could be competed for under the auspices of any aero-club affiliated to the International Aeronautic Federation. The 1908 winner, it was decided, would have to fly a distance "at least equal to double the distance of Farman's record," in other words, about one mile and a quarter, and in subsequent years the winner would have to fly at least double the winning distance of the previous year.

It was quickly pointed out, however, that even if each winner only flew just double the distance of his predecessor, the final winner of the cup in 1917 would have to fly a minimum of six hundred and forty miles.

As a matter of fact, Wilbur Wright won the prize in 1908 with a distance of nearly seventy-seven miles instead of one mile and a quarter, and were that rule now in force, the ultimate winner in 1917 would be under the obligation of making a continuous flight of at least forty thousand miles, or nearly twice around the earth!

The rules governing the distribution of the Michelin prizes were, however, not definitely drawn up until April 14, 1908. In the meanwhile Farman had already doubled his record by flying 1 mile 433 yards, and Delagrange had just quadrupled it by covering 2 miles 773 yards in six minutes, thirty seconds, and had only missed the official recognition of a record of nine minutes fifteen seconds, by grazing the ground two minutes forty-five seconds after he started.

The results of these flights clearly indicated the startling rapidity with which aviation would progress, and it was decided that rules as to the minimum distance to be flown and the conditions under which it was to be measured would be also formulated from year to year, as warranted by aeronautical progress.

The givers, however, increased the total sum of the yearly prizes to thirty-two thousand dollars, deciding that it should be divided in eight prizes of four thousand dollars each, instead of ten of three thousand, as first projected.

The Cup will therefore be won outright on December 31, 1915.

It may here be said that the original design accepted for this Challenge trophy embodied a miniature reproduction of a famous French biplane, which at the time the trophy was founded, was the only machine positively known as being capable of sustained flight; when Wilbur Wright loomed up as a likely winner, the design was changed to the present allegorical one: a large bat-like winged creature which struggling and shackled humans are endeavoring to cling to and follow in its flight.

1908

For 1908 the conditions called for a triangular course, marked out with stakes or buoys, as the case might be, with the stipulation that no one side of the triangle should exceed one kilometre in length.

The distances covered before the first stake was passed in flight, and after the last stake was passed, before alighting, were not to be counted in the official figures.

In the middle of the following September Wilbur Wright, who for some weeks had been at Le Mans, astounding Europe with his demonstrations of mechanical flight, decided to compete for a minor prize of one thousand dollars, governed by the same rules as the Michelin prize, except that it was only open to competition until September 30th, instead of until December 31st.

Wright elected to compete for both prizes at the same time and September 18th was the day selected; but the great crowd which had gathered at the Camp d'Auvours during the night was doomed to disappointment, for on this morning Wilbur Wright received the cablegram announcing the accident at Fort Myer of the previous afternoon, which had resulted in mortal injuries to Lieut. Selfridge, and in very serious injury to Orville Wright.

It was a critical time for the Wrights. Notwithstanding the younger brother's great flights at Fort Myer the preceding week, many foreign authorities were still doubtful of their superiority, and the accident was the occasion of an outburst of I-told-you-so's on the part of the detractors of their invention.

Wright, who was to receive one hundred thousand dollars for the French rights on his machine, if he made two flights of one hour each carrying a passenger and fuel for one hundred and twenty-five miles, did not let the Washington accident delay his plans for more than a few days. His confidence unshaken, he called the Aviation Committee together for Monday, September 21st, to control his trial for the two prizes, and on that day showed the world once for all the worth of his aeroplane.

Leaving the ground at 5:17 in the afternoon, he did not alight until 1 hour 31 minutes 25 4-5 seconds later, according to the official timing, thus breaking his brother's world's record by more than seventeen minutes, and his own European record of the previous week by more than fifty-two minutes.

He had completed the triangular course of two kilometres thirty-three times, but the distance credited to him for the two prizes he was competing for fell far short of these forty-one miles.

The rules of the competition stated that no distance could be counted after sunset, and the sun had gone down fifty-one minutes after Wright started. At that time he had covered nineteen circuits, or between twenty-three and twenty-four miles, and, according to the rules, this was the official distance of his trial for the Cup and prizes. It was thought at first that only fifteen circuits would be credited to him: sunset occurred on that day in the latitude of Paris and Le Mans at exactly six o'clock, but because Paris time is used all over France and Le Mans is over one hundred miles west of the metropolis, it was found that Wright had eight and a half minutes more to fly before sunset actually occurred in the longitude of Le Mans; in other words, it was only eight and a half minutes to six by geographical, or local time, when it was six in Paris.

This exactitude on the part of the committee in charge shows what precautions were taken to follow the rules to the letter, and speaks well for the spirit of fair play shown towards Wright in France.

Three days later Wright made another trial; he flew but 54 minutes 3 1-5 seconds, but in this time covered twenty-four and three-eighths miles—adding about twelve hundred yards to the official figures of his previous trial.

At this time Henry Farman, on a Voisin biplane, was also making trials for the two prizes, near Chalons, and excitement ran high in the last days of September as to who should win the smaller prize—the prix de la Commission d'Aviation de l'Aéro-Club de France.

In a trial on September 28th Wright increased his distance to nearly thirty miles, which he covered in 1 hour 7 minutes 24 4-5 seconds. He rightly judged this sufficient to win the minor prize, for, notwithstanding Farman's game efforts in the last two days of the month, when he made flights of 42 minutes and 35 minutes 36 seconds, respectively, Wright proved an easy victor.

On October 2d Farman made a flight of 44 minutes 32 seconds, which for many months was to be the record for French-built machines.

In competing later in the year for the Michelin cup, Wilbur Wright met with practically no opposition, and, if he had elected not to better his record, his distance of September 28th would still have landed him a winner, and this, notwithstanding Farman's renewed efforts at long-distance flying in the last days of 1908.

It was on December 18th that Wright once more flew for the prize, and the effort was crowned with success. He succeeded in more than doubling his distance and in beating his world's record for duration of flight by over twenty-three minutes, the figures being sixty-two miles and 1 hour 54 minutes and 53 2-5 seconds, respectively, of which 61½ miles (in 1 hour 53 minutes 59 2-5 seconds) counted for the Michelin Cup.

Bad weather prevented his making any further effort, until the penultimate day—December 30th. Sixty miles and 1 hour 52 minutes 40 seconds were the time and distance of this flight, so that he just failed to come up to his previous best; but when it is borne in mind that the temperature was 23 degrees Fahrenheit, and that the speed of this biplane was little, if any, less than forty miles an hour, the heroic nature of the feat will be better appreciated.

On the last morning of 1908 Wright made another start, but after forty-two minutes of flight a gasoline feed-pipe broke, and he had to land. His one chance left to improve his record was to fly from two in the afternoon until sunset, for starts between twelve and two were not allowed.

Wilbur Wright availed himself of it to the full. The start was given him exactly at two; he rose from the monorail three seconds later, and flew until twenty minutes after four, sunset having occurred just eighty seconds before he landed. The distance counting for the Michelin cup proved to be seventy-six miles and fifty-five hundredths and the time between passing the first and last stakes 2 hours 18 minutes 33 3-5 seconds. The total time Wright was in the air was 2 hours 20 minutes 23 1-5 seconds, which stood as a world's record until August of last year.

The anxiety of the committee to give the American aviator every chance is again shown by the fact that although they once more ignored Paris time for the sunset, they adhered to it for the start, which gave Wright eight and a half minutes more time in which to add to his record than if he had been flying near Paris.

1909

The rules governing the Michelin Cup competitions for 1909 differed but little from those of 1908, except that the winner had, of course, to exceed Wright's 1908 distance, and that the course did not need to be triangular, a four-cornered one being allowed. This, of course, brought the official distance nearer the actual distance covered, as the sharper the corner the greater is the ground lost when going around it.

It was intended to have competitions for the Michelin Cup on the final day of the great Rheims meet, held in August, 1909, but the Betheny aerodrome measured more than six miles around and the Michelin rules call for a two-and-a-half-mile course, as a maximum. It was thought that it would be dangerous to have aeroplanes flying over different courses at the same time and the idea was given up.

At the Berlin meet, held a month later, on an aerodrome only one mile and nine-sixteenths in circuit the same size as that at Belmont Park, New York, the Germa. Aero Club undertook to officially control competitions for the Michelin Cup, in conjunction with those for their prizes. On October 1st Rougier, the old de Dietrich automobile racer, driving a Voisin biplane, flew fifty-two laps (about eighty miles and three-quarters) in 2 hours 41 minutes and 50 seconds, beating Wright's distance by about four miles and a quarter.

Exactly a month later—November 1, 1909—Rougier's distance was beaten by Paulhan, who on that day made a continuous flight of 96 miles (in 2 hours 49 minutes 20 seconds) at the Brookland's motor track, Weybridge, England. Paulhan drove a Henry Farman biplane.

A question was raised at the time as to whether Rougier's and Paulhan's flights would count for the trophy, they not being members of the aero-clubs of the countries in which they made them (one of the general rules of the contest). All disputes were settled, however, when Henry Farman made his great effort for the record and the prize, on November 3rd; the flight was made at Mourmelon, over a four-cornered course, and Farman kept up for 4 hours 17 minutes 53 2-5 seconds, during which he officially covered 144.29 miles—nearly 50 miles more than Paulhan had on a similar machine forty-eight hours before. The last six miles or so were covered after sunset and the distance for the Michelin cup was first given out as 138 miles. It was found, however, that the 1909 rules made no stipulation as to sunset, and Farman was credited with the full distance.

Both time and distance remained world's records until this year's meet at Rheims, and although several of the more famous aviators (Hubert Latham among others) endeavored in the last days of 1909 to surpass the performance, the Michelin cup for 1909 and the $4,000 prize attached to it went to Henry Farman.

1910

The rules for the current year allow the Cup to be contested for either over an aerodrome or across country, on condition that it can be fully observed that no contact with the ground occurs.

Entry for the contest must be made two days before it, before 4 o'clock in the afternoon, the entry fee ($10.00) holding good for four days in the case of a special attempt or for the full length of a meet, if tried for during the said meet.

There was, a few weeks ago in France, quite a controversy as to who was at that time the temporary holder of the 1910 cup: at Rheims, on July 7th, Jan Olieslaegers, on a Gnôme-Blériot, flew 158.45 miles without landing (in 3 hours 39 minutes 29 seconds), breaking Farman's distance record, but not the duration one. On July 9th, at the same meet, Labouchère, on an Antoinette, flew 211.28 miles in 4 hours 37 minutes 2-5 second, thus beating both distance and duration records, and for the first time passing the 200-mile mark.

The very next day, Olieslaegers made the great flight which remained the world's record for nearly four months. During the 5 hours 3 minutes 5 1-5 seconds that he was in the air he covered officially 244.04 miles, and was immediately acclaimed as the leader in the race for the 1910 Michelin Cup. Olieslaegers, however, is not a member of the Aero Club of France, and when this was pointed out Labouchère was looked upon as the holder *pro temporê.*

There is a Labouchère in the list of members of the Aero Club of France, but it turned out that this is a cousin of the Antoinette driver, who, himself, is not a member. The point came up when Simon, on a Gnôme-driven Blériot, made his flight of 174 miles at Bordeaux on September 14th (in 3 hours 56 minutes 56 seconds); it was shown that Labouchère was not a member and that Simon, who was one, was the real holder. Two days later—September 16th—Aubrun, the second of the Circuit de l'Est, made a flight of 197 miles (in 3 hours 45 minutes 30 seconds) at the same aerodrome. Anbrun, like Simon, is a member of the Aero Club of France and is thus eligible to compete for the prize, in France.

It was hoped that the Belmont Park Meet several of the flyers would make attempts for the Michelin 1910 Prize.

The reason they did not is obvious enough: it must be borne in mind that a successful attempt on the Cup, if made before the very end of the year, may be immediately afterwards eclipsed by another and thus receive not the smallest compensation, if it is not made while competing for some other prize at the same time.

In Europe an aviator's attempt for the Michelin prize during a meet, (once he is regularly entered for it) is merely incidental to his efforts at totalization of distance—affording an incentive to indulge in long flights without alighting, to increase his total, instead of in more numerous flights of shorter duration.

An aviator who just fails to better the Michelin Cup distance thus receives full credit for his performance in the totalization of distance or duration of the day and of the meet.

At Belmont Park, on the other hand, the totalization prizes did not extend throughout the flying hours every day but were confined to single and specific hours: they therefore did not benefit a man undertaking a five or six hour flight.

On October 28th, backed by the firms of his aeroplane and of his motor, Maurice Tabuteau, the crack Maurice Farman driver and the hero of the France-to-Spain trans-Pyrennean flights, left the ground at Buc at 8:45 in the morning, with the determination of not landing before all records for distance and duration were his,—his flight counting for the Michelin Cup. Several months before (July 9th) Tabuteau had proved his endurance in a 3 hour 35 minute flight, during which he covered 231 kilometres. In his great flight for the Cup in the Fall, he practically doubled these figures; his records (289.4 miles and 6 hours 1 minute 35 seconds) standing until the last days of the year.

Tabuteau is thus the first man to have "held the air" a quarter of a day.

But the real struggle for the 1910 Prize did not begin until the last three weeks of the year; it brought out the finest long-distance flying as yet witnessed.

Georges Legagneux, the most popular and most versatile pilot in France, opened hostilities at Pau, on December 13th, when, on the same machine on which he had broken the world's altitude record, four days before, he set out after Tabuteau's figures. Legagneux had made his headquarters in the south of France because of the mildness of the winter there. The failure of his first attempt was due, however, to the weather, a storm compelling him to come down early in the afternoon; his official distance figured out at 392 kilometres (243.6 miles); this is within half a mile of that which Olieslaegers accomplished in his record-breaking flight at the end of the Rheims meet last July: it is worth noting that Legagneux took but 4 hours 34 minutes to go the distance as against the skilful Belgian's 5 hours 3 minutes, the difference being due partly, no doubt, to the slightly larger course at Pau but especially to the superiority in speed of Legagneux's Gnôme-Blériot over Olieslaegers'. The world's records made by Legagneux for three and four hours were 256.7 kilometres and 343.3 kilometres respectively. He carried a load of 150 litres of gasolene and 40 litres of oil.

The next attempt to dethrone Tabuteau was made by no less a celebrity than Henry Farman. Methodically, without haste, leaving nothing to chance, Farman had had a special machine built to repeat his 1909 victory: this long-distance aeroplane was fitted with huge tanks—230 litres capacity for gasolene and 80 litres for the castor oil, or large enough for a twelve-hour flight. Farman had the machine taken to his school at Etampes, and at 9.11:30 A. M. December 18th rose from the ground with his huge load of fuel and lubricant: he did not land again until 5.24:15 P. M., staying up longer than the sun did on this day, in the latitude of Etampes!

Dring these 8 hours 12 minutes 45 seconds (which at this writing constitute the world's duration record) Farman had travelled at an average speed of but 35 miles an hour, as compared with Tabuteau's 48 miles, so that, notwithstanding the great superiority of his performance in duration, he actually fell 2,120 metres short of the distance (465.720 metres) of his brother Maurice's best driver.

He could have flown longer and beaten this distance, but was misled into believing he had already done so by the cheers of the spectators, who could not wait until he had actually exceeded it to voice their enthusiasm. The last hour or so of Farman's flight was made in darkness, his machine being fitted with fore and aft electric lamps to enable his flight to be controlled after sundown.

It was on December 21st that Legagneux made his second attempt and this time success was the reward of his tenacity, and the World's Distance Record came back to the monoplanes.

Starting at 8.34:15 a. m., Legagneux kept to his task until 2.33, flying with great regularity and at a slightly higher speed than on his previous attempt, he thus once more broke all records from 200 kilometres on. In the 5 hours 59 minutes he was up, Legagneux covered 515.9 kilometres (320.565 miles) and took the lead for the Cup.

Outside of the Distance Record the new figures set up by the popular Frenchman were:

Three hours	258.5 kil.	300 kil	in 3 hrs. 28 min.
Four hours	345.5 kil.	400 kil	in 4 hrs. 38 min.
Five hours	432.2 kil.	500 kil	in 5 hrs. 48 min.
Six hours	515.9 kil.		

With only ten days to go, the competition between the various flyers for the classic trophy became acute: at Pau, Legagneux held himself in readiness to surpass any successful attempts to better his distance; at Etampes, Henry Farman, and at Buc, Tabuteau, filled their tanks overnight to be ready at the first streak of dawn to start out in the conquest of kilometres, if the weather prospects were in any way encouraging; others in various parts of France and elsewhere began to reveal their aspirations and show that they, too, had their eye on the coveted prize.

Thus Pierre Marie the clever driver of R. E. P. monoplanes, (whose full name is Pierre Marie Bournique), prepared to enter the contest at Buc, showing that Robert Esnault-Pelterie, after years of labor, had at last got his monoplane and his engine properly adjusted and tuned up; at Douai, an R. E. P. motor also figured in Louis Bréguet's plan of action, one of his remarkable biplanes having been fitted with the compact little engine for special Cup-winning purposes.

At Mourmelon, Réné Thomas represented the Antoinette company in the struggle, achieving on his first attempt, on Christmas Day, a flight of 2 hours 35 minutes; at Mouzon, Roger Sommer also made preparations. Nor was the competitive activity confined to France; in Austria, Illner proposed to add to the fame of the Etrich monoplane by a record-breaking flight, while here, in America, the two men whose death was to cast gloom over the whole aeronautic world at the very hour when the struggle reached its climax—Moisant and Hoxsey—entered for the Michelin Cup, the writer being delegated to New Orleans by the Aero Club to witness Moisant's trial and Mr. Twining performing the same office for Hoxsey at Los Angeles.

Farman and Tabuteau both made earnest attempts on December 29th to displace Legagneux's figures, but were beaten by the fog and the rain: Tabuteau had gone about 400 kilometres, his time for 390 kilometres being 5 hours 12 minutes 49 1-5 seconds, and Farman had gone 150 kilometres in something under two hours and a half.

Apparently feeling no fatigue from this effort, Tabuteau was off the next day before sunrise; he flew from 7.40 a. m. to 3.28.31 3-5 p. m., covering the tremendous distance of 584.635 kilometers (363,782 miles), or some 40 miles more than Legagneux. This performance was to prove the winning one, for no other flyer was able to equal it that day or the next.

Renaux, on another Maurice Farman, flew 220 miles in about 5 hours and Thomas on his Antoinette, 163 miles in 3 hours 5 minutes 4 seconds on the penultimate day; while on the last one Henry Farman made one last game effort (302 miles in 7 hours 11 minutes), going much faster than on December 18th, a broken lubricating pipe bringing him down; at Buc, Pierre Marie made a startling flight of 530 kilometres in 6 hours 29 minutes 19 1-5 seconds; at Douai, Bréguet did 390.42 in 5 hours 2 minutes 41 seconds; at Douzy, Sommer was up 2 hours 40 minutes, and at Pau, Legagneux flew for 2 hours 20 minutes in a high wind.

It was in a preliminary trial, prior to making his intended attempt that Moisant was killed at Hanrahan, near New Orleans; he was prepared to fly seven hours and stood a good chance of winning the trophy for America. Hoxsey, at Los Angeles, gave up the idea of attempting the long flight on learning of Tabuteau's distance of the previous day, and decided to go for altitude instead: it was in this flight that he sustained his fatal fall.

The table below gives the history of the successful attempts for the trophy in succinct form:—

Chronology of Successful Attempts for the Michelin Cup

Date.	Distance in Kilometres.	Aviator.	Aerodrome and its Perimeter in Metres.		Aeroplane.	Motor.
			1908			
Sept. 21	**38,**	Wilbur Wright,	Camp d'Auvours, near Le Mans,	2,000 metres,	Wright biplane	Wright
" 24	**39,095**	" "	" " " "	2,005 "	" "	"
" 28	**48,12**	" "	" " " "	2,005 "	" "	"
Dec. 18	**99,**	" "	" " " "	2,200 "	" "	"
" 31	**123,2**	" "	" " " "	2,200 "	" "	"
			1909			
Oct. 1	**130,**	Henri Rougier,	Johannisthal, near Berlin,	2,500 "	Voisin "	E. N. V
Nov. 3	**232,212**	Henry Farman,	Mourmelon, near Rheims,	3,138 "	H.Farman "	Gnôme
			1910			
Sept. 14	**280,**	René Simon,	Beau Désert, near Bordeaux,	2,500 "	Blériot monoplane	Gnôme
" 16	**317,**	Emile Aubrun,	" " " "	2,500 "	" "	"
Oct. 28	**465,72**	Maurice Tabuteau,	Buc, near Versailles,	7,600 "	M. Farman biplane	Renault
Dec. 21	**515,9**	Georges Legagneux,	Pau,	6,700 "	Blériot monoplane	Gnôme
" 30	**584,635**	Maurice Tabuteau,	Buc, near Versailles,	7,600 "	M. Farman biplane	Renault

Records and Statistics

CORRECTIONS RECOMMENDED UNDER THIS HEAD IN VOLUME I OF AIRCRAFT.

APRIL.

Some slight errors which occurred on page 73 were pointed out on page 110. Here are two, however, which escaped notice until recently:

In the "Fifteen Longest Flights of 1908" it was W. Wright, not *O.* Wright, who made the flight of 54' 03 1/5" on September 24th; at this time Orville Wright was in the hospital at Washington as a result of his serious fall of September 17th.

In the "Hour-flights of 1909" the 1 hr 12' 40" flight of Orville Wright's was made on July 27th, not July 29th; this was the record-breaking passenger-carrying flight counting for the Government tests, which extended until August 28th but were subsequently extended for three days.

In Table III, which shows where the various aviators flew, prior to 1910, Fournier figures as having flown in England; although he was at Blackpool and made many trials it is questionable whether he actually left the ground.

The same may be said concerning Prévoteau in Denmark, and Speckner in Switzerland; they drove aeroplanes in these countries, but their flights, if any, were at most, hops. A point of interrogation is therefore in order in these three cases.

In several instances the times of flights given exceed the official figures usually quoted, notably in the case of flights made at the Rheims Meet (August, 1909); this is because the official timing only quotes the duration of the flight up to the time of the last crossing of the timer's box; the time given in AIRCRAFT is the actual time the machine was in the air, obtained from independent and reliable witnesses and conservatively quoted with the closest approximation possible. Such are H. Farman's flight of August 27th, 1909, and Rougier's, Latham's, de Lambert's and Tissandier's best flights in 1909.

MAY.

On page 110, Sommer is quoted as the seventh man to fly for an hour in view of his flight of July 22nd, 1909; he should, however, be placed sixth in view of his flight of July 18th. This mistake is referred to on page 144, but is worth pointing out here.

In this list of the first men to make hour flights should figure Hamilton's name; this omission is repaired on page 189.

JULY.

Paulhan's flight of April 18th was 2h. 3m., instead of 3h.

Other errata on page 189 are given on page 217.

AUGUST.

The exact time of Harmon's flight was *2* hrs. 3' 30".

In the table giving "First Flights in Different Countries," the word "flight" means any loss of contact with the ground, whether prolonged, controlled or otherwise; any other ruling would have made it too difficult to discriminate between hops and real flights. Thus Ader's and Ellehammer's first successful efforts in this direction are quoted—

(Continued on Page 449)

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RECORDS AND STATISTICS—(Continued from Page 445)

also Defries' very short flights in Australia. In the case of the Wright brothers, the date of December 14th, 1903, might here be quoted instead of December 17th, 1903, as on this day Wilbur Wright was up two to three seconds in his first attempt at power-flight.

Switzerland does not figure in this table, as it is still a question who flew first there; several claim the honor, among them Auf'm Ordt, who broke his machine on the frozen surface of the lake at San Moritz early in 1909, and Speckner, who was practising near Geneva in December, 1909.

Since this list was published flights have been made in Cuba, Brazil, Uruguay, Bulgaria, Servia, Tunisia, India, Cochin-China, Japan, Hawaii, etc.

The "Records of Rheims Meet," given on page 219, were from cabled reports; fuller and more correct records of the meet are given on page 258.

OCTOBER.

Owing to a fault in the printing no margin was allowed between the second and third columns on page 296. The first paragraph reads:

"And now this great record has been made almost insignificant by the stupendous performances of this same Morane at Deauville on September 3rd, and of Chavèz at Issy on September 8th"———and the others accordingly.

NOVEMBER.

Aubrun's record for 200 kilometres is 2 hrs. 18' 30 3/5", and not 2 hrs. 18' 18 3/5".

The equivalent of 172.5 kilometres (Two hour record) is 107.2 miles, and not 105.6 miles.

DECEMBER.

On page 359 Latham's times for 95 kilometres and for 100 kilometres were 5 hrs. 45' 05.66" and 5 hrs. 48' 53.41" respectively, instead of the figures given.

JANUARY, 1911.

On page 391 the full names of the Italians killed were: Lieutenant Marquis Vittorio Vivaldi-Pasqua, Lieutenant Giuseppe Saglietti, Enrico Cammarota and his passenger, Private Giuseppe Castellani.

In the last two weeks of 1910 the following fatalities occurred: December 22, Cecil Grace, a naturalized Englishman of American birth, driving a Short-Grace biplane; lost in a fog in the North Sea; December 26, Giulio Piccolo (Italian), lost control of his Blériot while flying at São Paulo, Brazil; December 28, Alexandre Laffont (Frenchman), and his passenger, Mario Pola (Spaniard), fell in their Antoinette at Issy-les-Moulineaux parade-ground, near Paris, when about to start for the Paris-Brussels-Paris prize (wings broke in the air); December 30, De Caumont (Frenchman), fell at St. Cyr (steering gear of his Nieuport monoplane became deranged); December 31, John B. Moisant (American), miscalculated glide when about to land at Harahan, near New Orleans, La., and was thrown from machine when gust hit tail of his Blériot; December 31, Arch. Hoxsey (American), fell in his Wright biplane at Los Angeles, Cal., from height of over 500 feet; was probably physically indisposed by sudden change of pressure when coming down rapidly from great altitude.

Since 1910 the only fatality reported at this writing is the death of the Croatian aviator Roussijan, on January 9th, in Servia, after making a flight across the Save; his propeller became detached and he was unable to pick out good landing.

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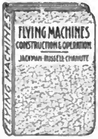

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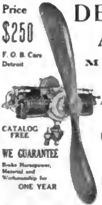

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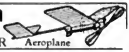

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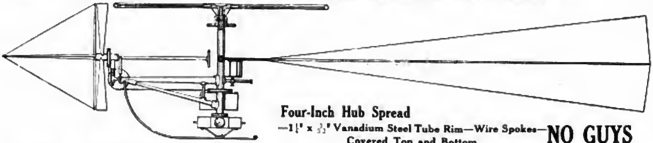

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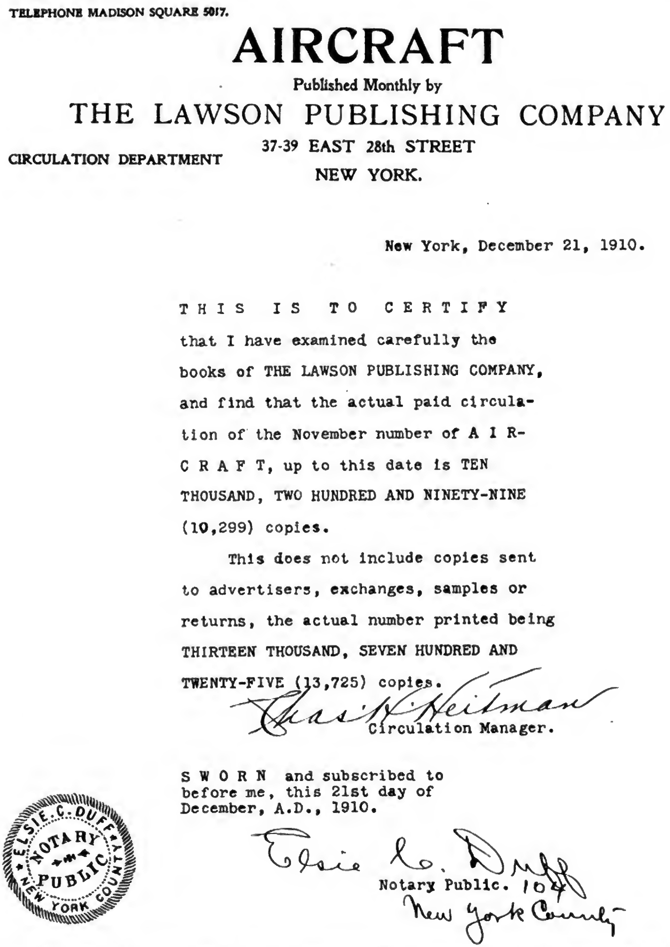

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Eight Cylinder, 80 Horsepower, Weight Complete with Carbureter, Magneto and Water-Pump: 250 Pounds.

An Entirely New Measure of Reliability in Aeronautical Motor Building Has Been Created In

"THE HALL-SCOTT" MOTORS

OTHER FEATURES ARE

SIMPLICITY LIGHTNESS STRENGTH CONSTANT POWER

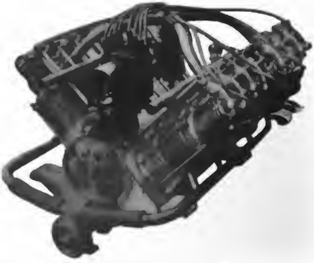
A Word from Hamilton on the Purchase of a Motor for an Aeroplane:

"There are no factors so important to consider when choosing an aeroplane motor as reliability and trustworthiness.

"In the designing and construction of these motors the best brains and the best material available are employed.

The Hall-Scott is the crowning feature of my experience after having been actively engaged in the conquest of the air and I am in a position to know what is required of an aeroplane motor.

"The flights I have made have satisfied me that this engine is exactly what is required to get the best results out of an aeroplane, and I have no hesitancy in stating to flyers that these motors are what I believe to be the most reliable aeronautic motors yet produced."



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CATALOGUES UPON REQUEST

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"GNÔME"

The "Wizard of Aviation"

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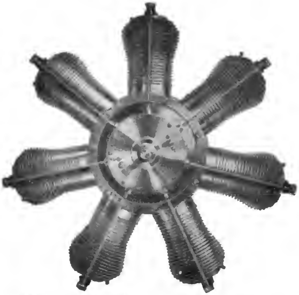

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DISTANCE—243 miles
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SPEED—77.67 miles an hour
ALTITUDE—10,499 feet
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CHAUVIÈRE INTÉGRALE PROPELLERS

RESULTS TELL THE STORY

MOROK, THE NEW WIZARD OF THE AIR.

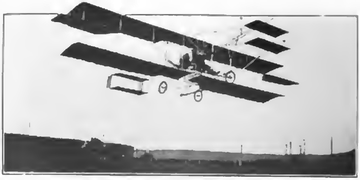
Morok's recent sensational flights at Newark, New Jersey, were made with an Elbridge "Featherweight" engine after just five days of practice. First day, perfect straightaway flight; second day, circled the field; third day, flew over building and trees; fourth day, 'cross country; fifth day, 'cross country. At Newark Morok flew 'round the big chimney at a height of 250 feet, dove over the grand-stand, and did other sensational stunts.

B. F. ROEHRIG, HOLDER NOVICE ALTITUDE RECORD.

B. F. Roehrig, of San Diego, Cal., flying with 6-cyl. Elbridge "Featherweight." Holds Knabenshue Cup for first sustained amateur flight on Pacific coast. Has made exhibition flight at altitude of 600 feet, and frequently carried passengers on some of his hundreds of successful flights.

WM. EVANS, HOLDER NOVICE DISTANCE RECORD.

Wm. Evans, of Kansas City, made a cross-country flight of nearly thirty miles on his second day of practice. Has been flying in exhibitions since two days after he received his machine. He uses a 4-cyl. Elbridge "Featherweight" engine.



C. F. WALSH, WINNER OF MANY EXHIBITION TROPHIES.

C. F. Walsh, of Los Angeles, Cal., flying with 3-cyl. Elbridge "Featherweight" won every cup at the Aero Club of California's meet at Los Angeles in November. He flew cross-country from the Motordrome and circled the course nine times before alighting. He also made notable quick-start novice records.

The above pictures are reductions from the illustrations in the booklet "Amateur Aviation in America." Free for the asking.

The 1911 Aero Special Engines weigh less and have far more power than the Elbridge "Featherweight" line. We will guarantee, and demonstrate them, to run ten solid hours with throttle wide open, under full load. Unquestionably the greatest Aero Engines in the world.

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